

CHINA CATALOGUE OF CULTURES

中国菌种目录

1992

China Committee for Culture
Collection of Microorganisms

中国微生物菌种保藏管理委员会 编著



China Machine Press · Beijing · 1992

机械工业出版社

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本目录是由中国微生物菌种保藏管理委员会组织所属的 7 个菌种保藏管理中心计 12 个单位共同编写的,由我国菌种保藏专业方面的专家审稿,具有较高的权威性。目录中收集了全国涉及农、林、牧、渔、工业、医药卫生、兽医、食品和抗生素等与微生物有关的菌种 10714 株,与 10 年前曾出版过的中文版相比,在菌种数量上有较大的增加,增加了 4659 株。为了便于同国外交流,除增加内容外,还改用英文出版,同时有中文菌名对照。

目录共分 7 部分:病毒、细菌、放线菌、酵母菌、丝状真菌、培养基和索引。主要介绍了菌株的学名、来源、分离基物、分离地、用途和特性,适宜的培养基和培养温度;介绍了每种甚至每株菌各需要适合其生长特殊组成的培养基;书后还有按菌号编排的索引。本书覆盖面广,全面、系统、实用、编排合理,便于查找。

本书适于农、林、牧、渔业,医院、药厂、食品厂、酿造厂的技术人员及有关研究院所、大专院校师生利用微生物资源时使用。

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Actias selene ningpoana nuclear polyhedrosis virus
 绿尾大蚕蛾核型多角体病毒

Baculoviridae

AS-IV 1.0105

Source: Larvae, Nanjing, Jiangsu. Preparation: Larvae. Incubation: 25—27°C, 9 days. Effect: Larvae death. Storage: Freeze-dried, -30°C. Host: *Actias selene ningpoana* F. Disease: Larvae swelled, died. Reference: Journal of Nanjing Forestry University (Natural Science), (2): 146—149, 1982. Character: Single nucleocapsid per envelope, virion = 295 × 54 nm.

Adenovirus Type 1

1 型腺病毒

IV, CAPM 1044 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Adenoid, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: None (Hypertrophied tonsils and adenoids). Reference: New Engl. J. Med. 251, 1077—1086, 1954. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 2

2 型腺病毒

IV, CAPM 1045 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Adenoid, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: None (Hypertrophied tonsils and adenoids). Reference: New Engl. J. Med. 251, 1077—1086, 1954. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 3

3 型腺病毒

IV, CAPM 1046 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Nasal washing, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Common cold (volunteer). Reference: New Engl. J. Med. 251, 1077—1086, 1954. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 4

4 型腺病毒

IV, CAPM 1047 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Throat washing, Fort Leonard Wood. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Primary atypical pneumonia. Reference: Proc. Soc. Exp. Biol. Med. 85, 183—188, 1954. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 5

5 型腺病毒

IV, CAPM 1048 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Adenoid, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: None (hypertrophied tonsils and adenoids). Reference: New Engl. J. Med. 251, 1077—1086, 1954. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 6

6 型腺病毒

IV, CAPM 1049 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Tonsil, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: None (hypertrophied tonsils and adenoids). Reference: New Engl. J. Med. 251, 1077—1086, 1954. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 7

7 型腺病毒

IV, CAPM 1050 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Throat washing, Fort Ord, California. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Pharyngitis. Reference: Am. J. Hyg. 62, 293—294, 1955. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

IV, CAPM 1051 ← CAMS

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Beijing. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Infantile primary viral pneumonia. Reference: Chinese Med. J. 81 (3), 141, 1962. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 7a

7a 型腺病毒

IV, CAPM 1052 ← CAMS

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Throat swab, Beijing. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Undifferentiated respiratory infection. Reference: Proc. Soc. Exp. Biol. Med. 97, 465—470, 1958. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 9

9 型腺病毒

Adenovirus Type 9 (Continued)**IV, CAPM 1053 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Stool, Boston, Massachusetts. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Rheumatoid arthritis. Reference: Ann. N. Y. Acad. Sci. 67, 311—325, 1957. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 10**10 型腺病毒****IV, CAPM 1054 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Eye swab, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Conjunctivitis. Reference: Proc. Soc. Exp. Biol. Med. 91, 260—262, 1956. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 11**11 型腺病毒****IV, CAPM 1055 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Stool, Oston, Massachusetts. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Paralytic polio (type 1 polio virus also recovered). Reference: Ann. N. Y. Acad. Sci. 67, 311—325, 1957. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 12**12 型腺病毒****IV, CAPM 1056 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Stool, Oston, Massachusetts. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Nonparalytic polio. Reference: Ann. N. Y. Acad. Sci. 67, 311—325, 1957. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 13**13 型腺病毒****IV, CAPM 1057 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Stool, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: None (Healthy child). Reference: Proc. Soc. Exp. Biol. Med. 97, 465—470, 1958. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 14**14 型腺病毒****IV, CAPM 1058 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-

conjunctival (APC) agent. Source: Throat swab, Netherlands. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Acute respiratory disease. Reference: Van Der Veen, J. et al. J. Hyg. 65, 119—129, 1957. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 15**15 型腺病毒****IV, CAPM 1059 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Eye swab, Saudi Arabia. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Conjunctivitis (early trachoma). Reference: Am. J. Ophthalmol. 43 (4) Part I, 32 (abstract), 1957. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 16**16 型腺病毒****IV, CAPM 1060 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Eye swab, Saudi Arabia. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Conjunctivitis (early trachoma). Reference: Am. J. Ophthalmol. 43 (4) Part I, 32 (abstract), 1957. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 17**17 型腺病毒****IV, CAPM 1061 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Eye swab, Saudi Arabia. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Conjunctivitis (early trachoma). Reference: Am. J. Ophthalmol. 43 (4) Part I, 32 (abstract), 1957. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 18**18 型腺病毒****IV, CAPM 1062 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Anal swab, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Niemann-pick disease. Reference: Proc. Soc. Exp. Biol. Med. 91, 260—262, 1956. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 19**19 型腺病毒****IV, CAPM 1063 ← WHO**

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Conjunctival scraping, Saudi Arabia. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Prepara-

tion: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Trachoma. Reference: Amer. J. Trop. Med. Hyg. 9, 523—526, 1960. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 20

20 型腺病毒

IV, CAPM 1064 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Conjunctival scraping, Saudi Arabia. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Conjunctivitis. Reference: Amer. J. Trop. Med. Hyg. 9, 523—526, 1960. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 21

21 型腺病毒

IV, CAPM 1065 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Conjunctival scraping, Saudi Arabia. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Trachoma. Reference: Amer. J. Trop. Med. Hyg. 9, 523—526, 1960. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 22

22 型腺病毒

IV, CAPM 1066 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Conjunctival scraping, Saudi Arabia. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Trachoma. Reference: Amer. J. Trop. Med. Hyg. 9, 523—526, 1960. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 23

23 型腺病毒

IV, CAPM 1067 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Conjunctival scraping, Saudi Arabia. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Trachoma. Reference: Amer. J. Trop. Med. Hyg. 9, 523—526, 1960. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 24

24 型腺病毒

IV, CAPM 1068 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Conjunctival scraping, Saudi Arabia. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: Trachoma. Reference: Amer. J.

Trop. Med. Hyg. 9, 523—526, 1960. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 25

25 型腺病毒

IV, CAPM 1069 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Anal swab, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: No specific illness. Reference: Proc. Soc. Exp. Biol. Med. 107, 434—437, 1961. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 26

26 型腺病毒

IV, CAPM 1070 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Anal swab, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: No specific illness. Reference: Proc. Soc. Exp. Biol. Med. 107, 434—437, 1961. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 27

27 型腺病毒

IV, CAPM 1071 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Anal swab, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: No specific illness. Reference: Proc. Soc. Exp. Biol. Med. 107, 434—437, 1961. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 28

28 型腺病毒

IV, CAPM 1072 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Anal swab, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: No specific illness. Reference: Proc. Soc. Exp. Biol. Med. 107, 434—437, 1961. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 29

29 型腺病毒

IV, CAPM 1073 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Anal swab, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C. 3—7days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: No specific illness. Reference: Proc. Soc. Exp. Biol. Med. 110, 710—713, 1962. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 30**30 型腺病毒**

IV, CAPM 1074 ← WHO

= Adenoid degeneration (AD) agent. Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Anal swab, Washington D. C. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3–7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: No specific illness. Reference: Proc. Soc. Exp. Biol. Med. 110, 710–713, 1962. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

Adenovirus Type 31**31 型腺病毒**

IV, CAPM 1075 ← WHO

= Adenoid degeneration (AD) agent, Adenoidal-pharyngeal-conjunctival (APC) agent. Source: Stool, Bristol. Usage: Preparation of antigen and antiserum for identification of new isolates and test antibodies. Preparation: Suspensions of primary cell cultures of HEK with CPE. Incubation: 37°C, 3–7 days. Effect: CPE. Storage: Freeze-dried, 4°C. Symptoms: None (healthy child). Reference: Lancet 1, 21–23, 1965. Character: Can be grown in primary cell cultures of HEK, HeLa and other cell lines with CPE.

African horse sickness virus (Type I)**非洲马瘟病毒 (I 型)****Orbivirus, Reoviridae**

CVCC AV1311 ← Beshavar Veterinary Service, Pakistan

= CVCC 1311

Usage: Vaccine and antiserum production. Preparation: Homogenized brain tissue suspension of infected mice. Incubation: 3 days. Effect: Death with neural symptoms. Storage: Freeze-dried, –80°C. Host: Horses, donkeys, mules, mice. Character: Modified strain selected by continuous passages of the virulent AHSV in mice. Inoculating the virus to mice (i. c.) causes typical neural symptoms in 51–59 hr and then the mice die rapidly. Fever and edema for inoculated (i. m.) horses. Solid immunity.

African horse sickness virus (Type I)**非洲马瘟病毒 (I 型)****Orbivirus, Reoviridae**

CVCC AV1312 ← Beshavar Veterinary Service, Pakistan

= CVCC 1312

Usage: Vaccine and antiserum production. Preparation: Homogenized brain tissue suspension of infected mice. Incubation: 2 days. Effect: Death with neural symptoms. Storage: Freeze-dried, –80°C. Host: Horses, donkeys, mules, mice. Character: Modified strain selected by continuous passages of the virulent AHSV. Causes neural symptoms (i. c.) in mice; potential period is 56–75 hr. Causes death of horses with fever and edema when infected by i. m.. MLD 50 is $10^{6.0}/0.05\text{ml}$ (i. c.). Virulence is stable.

African horse sickness virus (Type II)**非洲马瘟病毒 (II 型)****Orbivirus, Reoviridae**

CVCC AV1313 ← Beshavar Veterinary Service, Pakistan

= CVCC 1313

Usage: Vaccine and antiserum production. Preparation: Homogenized brain tissue suspension of infected mice. Incubation: 3 days. Effect: Death with neural symptoms. Storage: Freeze-dried, –80°C. Host: Horses, donkeys, mules, mice. Character: Modified strain selected by continuous passages of the virulent AHSV in mice. Inoculated (i. c.) mice appear neural symptoms, and then dead; potential period is 44–73 hr. Causes fever and edema for horses (i. m.). MLD 50 $\leq 10^{6.0}/0.05\text{ml}$ (i. c.).

African horse sickness virus (Type IV)**非洲马瘟病毒 (IV 型)****Orbivirus, Reoviridae**

CVCC AV1314 ← Beshavar Veterinary Service, Pakistan

= CVCC 1314

Usage: Vaccine and antiserum production. Preparation: Homogenized brain tissue suspension of infected mice. Incubation: 3 days. Effect: Death with neural symptoms. Storage: Freeze-dried, –80°C. Host: Horses, donkeys, mules, mice. Character: The virus causes neural symptoms and death of mice (i. c.); potential period is 61–83 hr. Causes fever and edema for the inoculated (i. m.) horses. MLD 50 $\leq 10^{6.0}/0.05\text{ml}$ (i. c.); stable virulence, good antigenicity.

African horse sickness virus (Type V)**非洲马瘟病毒 (V 型)****Orbivirus, Reoviridae**

CVCC AV1315 ← Beshavar Veterinary Service, Pakistan

= CVCC 1315

Usage: Vaccine and antiserum production. Preparation: Homogenized brain tissue suspension of infected mice. Incubation: 3 days. Effect: Death with neural symptoms. Storage: Freeze-dried, –80°C. Host: Horses, donkeys, mules, mice. Character: Modified strain selected by continuous passages of the virulent AHSV in mice. Typical neural symptoms and death for mice (i. c.); potential period is 65–92 hr; fever and edema for inoculated (i. m.) horses; MLD 50 $\leq 10^{6.0}/0.05\text{ml}$ (i. c.).

African horse sickness virus (Type VI)**非洲马瘟病毒 (VI 型)****Orbivirus, Reoviridae**

CVCC AV1316 ← Beshavar Veterinary Service, Pakistan

= CVCC 1316

Usage: Vaccine and antiserum production. Preparation: Homogenized brain tissue suspension of infected mice. Incubation: 3 days. Effect: Death with neural symptoms. Storage: Freeze-dried, –80°C. Host: Horses, donkeys, mules, mice. Character: Modified strain selected by continuous passages of the virulent AHSV in mice. Typical neural symptoms and death for mice infected (i. c.) with the virus; potential period is 65–92 hr; fever and edema for infected (i. m.) horses. MLD 50 $\leq 10^{6.0}/0.05\text{ml}$ (i. c.).

African horse sickness virus (Type VII)**非洲马瘟病毒 (VII 型)****Orbivirus, Reoviridae**

CVCC AV1317 ← Beshavar Veterinary Service, Pakistan

= CVCC 1317

Usage: Vaccine and antiserum production. Preparation: Homogenized brain tissue suspension of infected mice. Incubation: 3 days. Effect: Death with neural symptoms. Storage: Freeze-dried, –80°C. Host: Horses, donkeys, mules, mice. Character: Modified strain selected by continuous passages of the virulent AHSV in mice. Typical neural symptoms and death for infected (i. c.) mice, potential period is 46–60 hr, finally dead; fever and edema for inoculated (i. m.) horses. MLD 50 $\leq 10^{6.0}/0.05\text{ml}$ (i. c.).

African horse sickness virus (Type IX)**非洲马瘟病毒 (IX 型)****Orbivirus, Reoviridae**

CVCC AV1318 ← Beshavar Veterinary Service, Pakistan

= CVCC 1318

Usage: Vaccine and antiserum production. Preparation: Homogenized brain tissue suspension of infected mice. Incubation: 4 days. Effect: Death with neural symptoms. Storage: Freeze-dried, –80°C. Host: Horses, donkeys, mules, mice. Character: Modified strain selected by continuous passages of the virulent AHSV in mice. Typical neural symptoms for infected (i. c.) mice, potential period is 70–128 hr; fever and

edema for inoculated (i. m.) horses. MLD $50 \leq 10^{6.0}/0.05\text{ml (i. c.)}$.

Agrotis exclamatonis granulosis virus

警纹鸣夜蛾颗粒体病毒

Baculoviridae

AS-IV 1.0001

Source: Larvae, Bazhou, Xinjiang. Usage: Used as insecticides (pesticide). Preparation: Larvae. Incubation: 25—27°C, 4days. Effect: Larvae death. Storage: Freeze-dried —30, 4°C. Host: *Agrotis exclamatonis* L. cross-infected. *Agrotis segetum* S. Disease: Larvae swelled. Larvae died. Reference: in The Atlas of Insect Viruses of China, p65, 1986, Hunan Science and Technol. Press. Character: 1-2 virion per granules, abnormal granulosis in the GV, virion about $(350-450) \times (40-65)\text{nm}$, dsDNA.

Agrotis segetum granulosis virus

黄地老虎颗粒体病毒

Baculoviridae

AS-IV 1.0002

Source: Larvae, Xinjiang Wulumuqi. Usage: Used pesticide. Preparation: Larvae. Incubation: 25—27°C, 7days. Effect: Larvae death. Storage: Freeze-dried, —30°C. Host: *Agrotis segetum* S. Disease: Larvae changed soft, swelled, died. Reference: Acta Microbiologica Sinica, 1982, 22 (2): 123—125; 1983, 23 (1): 15—19; 1984, 24 (3): 230—231. Microbiology, 1978, 5 (2): 1—2. Scientia Agric., 1978, (1): 82—84. Character: Virion = $310 \times 70\text{nm}$, Sw, 20 = 1.400S, dsDNA, MW = $(12.6-46.1) \times 10^6\text{d}$.

Alfalfa mosaic virus

苜蓿花叶病毒 5

AS-IV 2.0123

Source: Leaves, Beijing. Preparation: Infected tobacco leaves. Incubation: 22—24°C, 14days. Effect: Pathological changes. Storage: Freeze-dried, —30°C. Host: Phaseolus, Solanaceae, Chenopodiaceae. Disease: Mosaic and mottling in most of the host. Reference: Study Report of Plant Examination, Jul. 1981. Character: Showing spherical shaped particle, TIP: 40—60°C DEP: 0.1—0.001 Longevity: 1—5 days.

Alphaea phasma nuclear polyhedrosis virus

褐点粉灯蛾核型多角体病毒

Baculoviridae

AS-IV 1.0118

Source: Larvae, Kunming. Preparation: Larvae. Incubation: 25—27°C, 9days. Effect: Larvae death. —30°C. Host: *A. phasma* L. Disease: Larvae swelled, then died. Reference: Forest Science and Technology, 1985, (3): 21—22; Hubei Agri. Science, 1984, (8): 24—25. Character: More than one rod-shaped nucleocapsids per envelope. Virion = $55.5 \times 333\text{nm}$, nucleocapsid = $296.2 \times 48.1\text{nm}$.

Andraca bipunctata granulosis virus

茶蚕颗粒体病毒

Baculoviridae

AS-IV 1.0060

Source: Larvae, Shuchen, Anhui. Preparation: Larvae. Incubation: 25—27°C, 7days. Effect: Larvae death. Storage: Freeze-dried, —30°C. Host: *Andraca bipunctata* W. Disease: Larvae festered died. Reference: Microbiology, (4): 61—67, 1982, 10 (2): 50—52, 1983. Character: Granules = $(300-350) \times (150-200)\text{nm}$, Virion = $(240-280) \times (60-80)\text{nm}$.

Antheraea pernyi nuclear polyhedrosis virus

柞蚕核型多角体病毒

Baculoviridae

AS-IV 1.0143

Source: Larvae, Liaoning. Preparation: Larvae. Incubation: 25—27°C, 7days. Effect: Larvae death. Storage: Freeze-

dried, —30°C. Host: *A. pernyi* G. Disease: Larvae swelled, died. Reference: Sericultural Science and Technology, 1958, (4): 322—324; 1959, (4): 223—226. Sericultural Science and Technology of Liaoning, 1979, (1): 1—2, 1981, (4): 1—10. Character: More than one rod-shaped nucleocapsids per envelope, virion = $(60-170) \times 350\text{nm}$, nucleocapsids = $55 \times 330\text{nm}$, virions containing 16 polypeptides, dsDNA.

Apple chlorotic leaf spot virus

苹果褪绿叶斑病毒

AS-IV 2.0103

Source: Leaves, Xincheng, Liaoning. Preparation: Infected apple leaves. Incubation: 25—27°C, 100days. Effect: Pathological changes. Storage: No Freeze-dried, 25—27°C. Host: Apple, Pyrus, Prunums persica. Disease: Chlorotic spot in apple trees. Symptoms: Acta Phytopathologica Sinica. Character: Showing fiber particle, $600 \times 12\text{nm}$. DEP: 0.0001—0.00001 TIP: 52—55°C Longevity: 1 day.

Apple dapple virus

苹果斑纹病毒

AS-IV 2.0001

Source: Leaves, Xincen, Liaoning. Preparation: Infected apple leaves. Incubation: 25—26°C, 100days. Effect: Pathological changes. Storage: No Freeze-dried, 25—26°C. Host: Apple, Pyrus. Disease: Dehiscent fruit. Withering and dwarfing in top of diseased plants; Chlorosis in leaves. Reference: Annual of Scientific Research 18, 1—3. Character: Graft infection. Line form, $600 \times 12\text{nm}$ DEP: 0.0001—0.00001 TIP: 52—55°C Longevity: 1 day (below 20°C) 10 days (below 4°C).

Apple mosaic virus

苹果花叶病毒

AS-IV 2.0028

Source: Leaves, Xincheng, Liaoning. Preparation: Infected apple leaves. Incubation: 25—27°C, 25days. Effect: Pathological changes. Storage: No Freeze-dried, 25—27°C. Host: Malus pumila, Pyrus, Chaenomeles sinensis. Disease: Mosaic in apple trees. Reference: Journal of Northwest Agricultural University, 1985. Character: Showing spherical particle, diameter 26nm, DEP: 2×0.001 TIP: 54°C.

Avian adenovirus (Duck adenovirus)

禽腺病毒

Aviadenovirus, Adenoviridae

CVCC AV70 * ← NCIVBP ← ATCC

= ATCC VR-9211 = Strain K-11

Source: Cloacal swab. Usage: Production of inactivated vaccine and diagnostic preparations. Preparation: Supernatant fluid of infected DK TC. Incubation: 38—40°C, 2—4 days. Effect: CPE, rounding of cells. Storage: Freeze-dried, —30°C. Host: DEF, CKC. Symptoms: No clinical signs. Reference: Avian Path. 7: 35—47, 1978 (En); Avian Dis. 26: 354—359, 1982 (En). Character: The fluid from DE inoculated by allantoic route produces 1:160000 HA titer with chicken RBC. Complete cross reaction with adenovirus strain 127 in HI test.

Avian adenovirus Type I

禽腺病毒 I 型

Aviadenovirus, Adenoviridae

CVCC AV1 ← NCIVBP

= Strain Ote-14

Source: Japan. Usage: Production of antigens. Preparation: Infected CEK TC or CAM of infected CE. Incubation: 3—4 days. Effect: CPE. Storage: Freeze-dried, —20°C. Host: CE, chicken. Character: It has been shown to cross-react with other avian adenoviruses in AGP test. Produces round cell type CPE in TC. Replicates better in homologous than in heterologous cell culture systems.

CVCC AV2 ← Institute of Laboratory Animal Science, Beijing

Avian adenovirus Type I (Continued)

Agricultural University ← ATCC

= ATCC VR-432 = Strain CELO = Strain Phelps Source: Egg.
Preparation: Infected CE AI Fl. Incubation: 3–4 days. Effect: Death of embryo. Storage: Freeze-dried, -75°C .
Host: CE, chicken. Symptoms: Endogenous virus of chicken eggs, embryo death. Reference: Am. J. Vet. Res. 18:657, 1975 (En). Character: Chicken, quails and rabbits not susceptible. Chicks inoculated by intracerebral route die with nervous symptoms. This strain has been shown to produce fibrosarcoma in hamsters. Replicates with typical adenovirus CPE in chicken cell culture.

Avian encephalomyelitis virus

禽脑脊髓炎病毒

Enterovirus, Picornaviridae

CVCC AV35 ← NCIVBP

= C21-2-1 = Strain Van Roekel

Usage: VN test or embryo susceptibility test. Preparation: Brain tissue suspension of infected SPF CE. Incubation: 37°C , 12 days. Effect: Muscular dystrophy. Storage: Freeze-dried, -70°C . Host: CE. Symptoms: AE. Character: This strain is pathogenic for embryos from susceptible flocks and produces muscular dystrophy and decreased movement, it is recommended to determine the neutralizing capacity of the antiserum.

CVCC AV36 ← NCIVBP

= C21-2-2 = Strain O20

Preparation: CE brain tissue suspension. Incubation: 37°C , 9–13 days. Effect: Muscular dystrophy. Storage: Freeze-dried, -70°C . Character: Causes disease in young chicks. Resistant to chloroform, trypsin and deoxyribonuclease.

Avian infectious laryngotracheitis virus

鸡传染性喉气管炎病毒

Herpesvirus, Herpesviridae

CVCC AV1231 ← Agriculture and Food Service, Hungary (1976)

= CVCC 1231 = Strain ILT/13

Source: Hungary. Preparation: Infected CE (CAM). Incubation: 37°C , 4–5 days. Effect: CAM oedema and thickening. Storage: Freeze-dried, -40°C – -70°C . Host: CE, CEK. Symptoms: Avian infectious laryngotracheitis. Character: MID $\geq 10^{-5}/0.2\text{ml}$ (CE), lesions on CAM; chickens injected intratracheally with $10^{-3}/0.1\text{ml}$ cause respiratory symptoms.

CVCC AV22 * ← NCIVBP

= Strain Beijing

Source: Trachea and larynx, Daxin County, Beijing. Usage: Challenge strain. Preparation: Infected CE (CAM). Incubation: 36°C , 5 days. Effect: Lesions on CAM. Storage: Freeze-dried, -70°C . Host: Chickens, chicken embryo. Symptoms: Avian infectious laryngotracheitis. Character: MEID $\geq 10^{-5}/0.2\text{ml}$, lesions on CAM, no HA or hemolysin.

CVCC AV23 * ← NCIVBP

Usage: Production of vaccine. Preparation: CAM of infected CE. Incubation: 36°C , 5 days. Effect: Lesions on CAM. Storage: Freeze-dried, -70°C . Host: CE, CEK. Character: MEID $\geq 10^{-5}/0.2\text{ml}$.

Avian influenza virus

禽流感病毒

Influenzavirus, Orthomyxoviridae

CVCC AV27 * ← NCIVBP

= C18-2-1 = Strain V73-67

Usage: Preparation of antigen. Preparation: AI-Am Fl of infected CE. Incubation: 37°C , 4–5 days. Effect: Hyperaemia, hemorrhage and death of embryo. Storage: No Freeze-dried, -30°C . Host: CE chicken. Character: CE death between 90–120hr after inoculation, hyperaemia and hemorrhage, HA for chicken RBC is 1:640.

CVCC AV28 * ← NCIVBP

= C18-1-1 = Strain Chica

Preparation: AI-Am Fl of infected CE. Incubation: 37°C , 1–2 days. Effect: Bleeding of embryo. Storage: Freeze-dried, -70°C . Host: CE, chicken. Character: Lethal to CE in 48hr, hyperaemia and hemorrhage of CE; HA titres for CRBC is 1:80–1:160.

CVCC AV2311 ← IFFA Merieux Institute, France

= CVCC 2311 = Strain Reo 1133

Usage: Production of antigen. Preparation: AI-Am fluid from CE. CEK TC. Incubation: 37°C , 2–3 days. Effect: Death. CPE (syncytial type). Storage: Freeze-dried, -70°C . Host: Chicken, CEK. Symptoms: Virus arthritis. Character: Produces syncytia type CPE in CEK cell cultures, which were proved more sensitive to the virus. No HA with chicken RBCs.

Bacillus anthracis phage

炭疽芽孢杆菌噬菌体

CMCC (B) 063601 ← LZIBP

Usage: Production of diagnostic. Incubation: 35°C , 4°C .**Avian reovirus**

禽呼肠孤病毒

AS-IV 6.0001

Source: Joint juice of chicken, Chicken farm in Fuzhou Jiangxi Province. Preparation: uric juice of chicken embryo. Incubation: 38°C – 39°C , 9 days. Effect: Pathological changes of chicken embryo. Storage: Freeze-dried, -20°C . Host: bird. Disease: pathological changes of chicken embryo. Reference: Shanghai Xumu Shouyi Tongxun (1): 4–5, 1988

Bacillus licheniformis 2709 temperate phage

地衣芽孢杆菌 2709 温和噬菌体

AS-IV 4. BL-2709 ← Institute of Microbiology, Academia Sinica, Beijing

= BL-2709

Source: Isolation as induced from host, Beijing. Usage: Preparation antigen and typing serum. Preparation: A temperate phage, designated as BLL1 was induced from B. licheniformis 2079 following exposure to mitomycin C or UV. Incubation: 37°C , 0.7 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C . Host: Bacillus subtilis As1.88X. Disease: Disrupt host. Reference: Chinese Journal of Virology, 3 (2): 163–168, 1987. Character: DNA, the molecular weight was 24.2kb, and the G+C content of the DNA WAS 31.2 mol%; Tm value 82°C .

Bacillus subtilis phage of BF7658

枯草芽孢杆菌 BF-7658 噬菌体

AS-IV 3. Bs-10 ← Institute of Microbiology, Academia Sinica, Beijing

= Bs-10

Source: Soil and Polluted water, Wuxi and Tianjin. Usage: Preparation antigen and typing serum. Preparation: B. subtilis BF7658 was disrupted by 3Bs-10 Phage liquid. Incubation: 37°C , 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C . Host: Bacillus subtilis BF7658. Disease: Disrupt host. Reference: Chinese Journal of Virology, 2 (4): 360–365, 1986. Character: Stable at pH5–11; Compared heat-resistant; Compared sensitive to chloroform; DNA of the phage BS-10 was digested with EcoRI and 8 fragments, the molecular weight of the phage DNA was 40.7kb, and the G+C Content of the DNA was 53.4 mol %, Tm Value 91.2°C .

AS-IV 3. Bs-11 ← Institute of Microbiology, Academia Sinica, Beijing

= Bs-11

Source: Soil and Polluted water, Wuxi and Tianjin. Usage: Preparation antigen and typing serum. Preparation: B. subtilis BF7658 was disrupted by 3Bs-11 Phage liquid. Incubation: 37°C , 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C . Host: Bacillus subtilis BF7658. Disease: Disrupt host. Reference: Chinese Journal of Virology, 2 (4): 360

— 365, 1986. Character: Survival at pH 4—13, Compared heat-resistant, Compared sensitive to chloroform, DNA of the phage BS-11 was digested with EcoRI, and 19 fragments the molecular weight was 71.1 kb, and the G+C content of the DNA was 51.0 mol%, Tm Value 90.2°C.

AS-IV 3. Bs-12 ← Institute of Microbiology, Academia Sinica, Beijing

= Bs-12

Source: Soil and Polluted water, Wuxi and Tianjin. Usage: Preparation antigen and typing serum. Preparation: *B. subtilis* BF7658 was disrupted by 3Bs-12 Phage liquid. Incubation: 37°C, 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: *Bacillus subtilis* BF7658. Disease: Disrupt host. Reference: Chinese Journal of Virology, 2(4):360—365, 1986. Character: Survival at pH 4—13, Compared heat-resistant and sensitive on chloroform, DNA of the phage BS-12 was digested with EcoRI, and 8 fragments the molecular weight was 39.9 kb, and the G+C Content of the DNA was 50.2 mol%, Tm Value 89.5°C.

Bacillus subtilis phages of BF7658

枯草芽孢杆菌 BF-7658 噬菌体

AS-IV 3. Bs-7 ← Institute of Microbiology, Academia Sinica, Beijing

= Bs-7

Source: Soil and Polluted water, Wuxi and Tianjin. Usage: Preparation antigen and typing serum. Preparation: *B. subtilis* BF7658 was disrupted by 3Bs-7 Phage liquid. Incubation: 37°C, 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: *Bacillus subtilis* BF7658. Disease: Disrupt host. Reference: Chinese Journal of Virology, 2(4):360—365, 1986. Character: Stable at pH 5—11, Compared heat-resistant, Compared sensitive to chloroform, DNA of the phage BS-7 was digested with EcoRI, and 6 fragments the molecular weight was 29.9 kb, and the G+C Content of the DNA was 42.3 mol%, Tm Value 89.5°C.

AS-IV 3. Bs-5 ← Institute of Microbiology, Academia Sinica, Beijing

= Bs-5

Source: Soli, fermentation liquid, Wuxi and Tian Jin. Usage: Preparation antigen and typing serum. Preparation: *B. subtilis* BF7658 was disrupted by 3Bs-5 phage liquid. Incubation: 37°C, 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: *Bacillus subtilis* BF7658. Disease: Disrupt host. Reference: Chinese Journal of Virology, 2(4):360—365, 1986. Character: The molecular weight was 24.2 kb, the G+C content of DNA was 31.2 mol%, Tm value 82°C.

AS-IV 3. Bs6 ← Institute of Microbiology, Academia Sinica, Beijing

= Bs-6

Source: Soli, fermentation liquid, Wuxi and Tian Jin. Usage: Preparation antigen and typing serum. Preparation: *B. subtilis* BF7658 was disrupted by 3Bs-6 phage liquid. Incubation: 37°C, 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: *Bacillus subtilis* BF7658. Disease: Disrupt host. Reference: Chinese Journal of Virology, 2(4):360—365, 1986. Character: Stable at pH 5—11, compared heat-resistant, compared sensitive to chloroform, DNA of the phage BS-6 was digested with EcoRI, and 18 fragments the molecular weight was 87.9 kb the G+C content of the DNA was 60.2 mol%, Tm value 94°C.

Bacillus thuringiensis phage

苏云金芽孢杆菌噬菌体

AS-IV 3. B1 ← Institute of Microbiology Guangdong Province

= TP-1

Source: Fermentation liquid, Guangzhou. Usage: Preparing antigen antibody providing serum typing and identifying host. Preparation: *B. thuringiensis* was disrupted by 3. B1 phage liquid. Incubation: 37°C, 0.7 days. Effect: Forming plaque. Storage: Freeze-dried -10°C. Host: *Bacillus thuringiensis* Berliner. Disease: Disrupt host. Reference: Acta Microbiologica Sinica 18(3):220—224 1978. Character: pH = 7,

Steady, 70°C, 20min inactivity not sensitive of Chloroform.

AS-IV 3. B2 ← Institute of Microbiology Guangdong Province

= TP-33

Source: Fermentation liquid, Guangzhou. Usage: Preparing antigen and antibody, providing serum typing and identifying host. Preparation: *B. thuringiensis* was disrupted by 3. B2 phage liquid. Incubation: 37°C, 0.7 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: *Bacillus thuringiensis* Berliner. Disease: Disrupt host. Reference: Acta Microbiologica Sinica 18(3):220—224, 1978. Character: pH = 7 Steady, 70°C, 20min inactivity, not sensitive on Chloroform.

AS-IV 3. B5 ← Institute of Microbiology Guangdong Province

= TP-21

Source: Fermentation liquid, Guangzhou. Usage: Preparing antigen and antibody providing serum typing and identifying host. Preparation: *B. thuringiensis* was disrupted by 3. B5 phage liquid. Incubation: 37°C, 0.7 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: *Bacillus thuringiensis* Berliner. Disease: Disrupt host. Reference: Acta Microbiologica Sinica 18(3):220—224, 1978. Character: pH = 7 Steady, 70°C, 20min inactivity, Not sensitive on Chloroform.

AS-IV 3. B6 ← Department of Biology Shandong University

= GP-10

Source: Fermentation liquid, Urban area of Jinan, Shandong. Usage: Preparing antigen and antibody providing, serum typing. Preparation: *B. thuringiensis* was disrupted by 3. B6 phage liquid. Incubation: 33°C, 0.7 days. Effect: Forming plaque. Storage: Freeze-dried -10°C. Host: *Bacillus thuringiensis* Berliner. Disease: Disrupt host. Reference: Acta Microbiology sinica 19(1):45—51, 1979. Character: Not sensitive on chloroform.

AS-IV 3. B7 ← Department of Biology Shandong University

= DP-7

Source: Fermentation liquid, Shandong. Usage: Preparing antigen and antibody, providing serum typing and identifying host. Preparation: *B. thuringiensis* was disrupted by 3. B7 phage liquid. Incubation: 33°C, 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: *Bacillus thuringiensis* Berliner. Disease: Disrupt host. Reference: Acta Microbiology Sinica 19(1):45—51, 1979. Character: Not sensitive on chloroform.

Barathra brassicae nucleor polyhedrosis virus

甘蓝夜蛾核型多角体病毒

Baculoviridae

AS-IV 1. 0050

Source: Larvae, Taian, Shandong. Usage: Used as pestitcid. Preparation: Infected larvae. Incubation: 25—27°C, 7 days. Effect: Larvae death. Storage: Freeze, -30°C. Host: *B. brassicae* L. Disease: Larvae swelled, died. Reference: Microbiology, 11(2):52—53, 1984. Character: Virion=0.4×0.21 μ, nucleocapsid=43×320nm.

Barley yellow dwarf virus

大麦(小麦)黄矮病毒

AS-IV 2. 0052

Source: Leaves, Xian, Shanxi. Preparation: Infected barley leaves. Incubation: 20—26°C, 25 days. Effect: Pathological changes. Storage: No Freeze-dried 20—26°C. Host: Barley, Wheat. Disease: Yellow dwarf on barley and wheat etc. Reference: Shanxi Agricultural Science, No. 5, 1981. Character: Showing spherical particle, diameter 30nm, ssRNA. Aphid transmission.

Bluetongue virus

蓝舌病毒

AS-IV 6. 0004

Source: Spleen, lymph node, Chuxan, Anhui. Preparation: Uric juice of chicken embryo. Incubation: 38—39°C, 9 days.

Bluetongue virus (Continued)

Effect: Pathological changes of chicken embryo. Storage: Freeze-dried, -20°C . Host: chicken embryo, sheep, ox. Disease: pathological changes of chicken embryo. Character: The virus particles were spherical, about 50nm in diameter. The nucleic acid of virus probably consisted of double-stranded RNA.

CVCC AV45 * ← ATCC

= ATCC VR-187=Strain 8

Source: California, USA. Usage: Serotyping. Preparation: Infected BHK-21 TC. Incubation: 36°C , 3–4 days. Effect: CPE. Storage: No freeze-dried, -75°C . Host: Sheep, suckling mouse, bovine, HeLa and BHK-21 cells and CE. Symptoms: Bluetongue disease (natural outbreak). Reference: J. Amer. Vet. Med. Assoc. 122:300, 1953 (En). Character: CE used for passage of virus must be incubated at 33.6°C . Produces hemolysis stable at -60°C . Antigenic types are demonstrable by neutralization but not by CF tests. Serotype 10.

CVCC AV46 * ← ATCC

= ATCC VR-872=Station *

Source: Texas, USA. Usage: Serotyping. Preparation: Viral suspension from clarified infected BHK21. Incubation: 36°C , 4 days. Effect: CPE. Storage: Freeze-dried, -75°C . Host: Sheep, all other ruminants, suckling mice, BHK21 cells. Symptoms: Bluetongue disease. Reference: Am. J. Vet. Res. 25:1598–1600, 1964 (En). Character: Non-hemagglutinating, CF antigen in common with epizootic hemorrhagic disease virus, serotype 11.

CVCC AV47 * ← ATCC

= ATCC VR-873=67-41B

Source: Blood, Idaho, USA. Usage: Serotyping. Preparation: BHK21 TC supernate. Incubation: 36°C , 3–5 days. Effect: CPE. Storage: Freeze-dried, -75°C . Host: BHK21 cells, sheep, all other ruminants, suckling mice. Symptoms: Bluetongue disease. Reference: 77 Ann. Proc. USAHA: 352, 1973 (En). Character: Non-hemagglutinating; CF antigen in common with epizootic hemorrhagic disease virus, serotype 13.

CVCC AV48 * ← ATCC

= ATCC VR-875=62-455

Source: Blood, Wyoming, USA. Usage: Serotyping. Preparation: BHK21 TC supernate. Incubation: 36°C , 4–5 days. Effect: CPE. Storage: Freeze-dried, -75°C . Host: BHK21 cells, sheep, all ruminants, suckling mice. Symptoms: Typical Bluetongue disease. Reference: Am. J. Vet. Res. 29:481–485, 1968 (En). Character: Non-hemagglutinating; CF antigen in common with epizootic hemorrhagic disease virus, serotype 17.

Bombyx mori cytoplasmic polyhedrosis virus

家蚕胞质型多角体病毒

Reoviridae

AS-IV 1.0007

Source: Larvae midgut. Preparation: Larvae midgut. Incubation: $25-27^{\circ}\text{C}$, 12 days. Effect: Larvae death. Storage: Freeze-dried, -30°C . Host: *Bombyx mori* L. Disease: Virus replicated at midgut cell, midgut swelled and whitened. Reference: Acta Biochemica et Biophysica Sinica, 1978, (4): 381–389; 1978, 11 (4): 394–396; Acta Microbiol. Sinica, 1978, 18 (2): 129–133; 1981, 21 (1): 73–76; 1980, 20 (3): 257–262. Character: Spherical virion = 69 nm, dsRNA, unstable at $\text{pH} < 4$ or in 30% ethanol.

Bombyx mori densovirus

家蚕浓核症病毒

Parvoviridae

AS-IV 1.0192

Source: Larvae gut, Zhenjiang. Preparation: Larvae gut. Incubation: $25-27^{\circ}\text{C}$, 15 days. Effect: Larvae death. Stor-

age: Freeze, -30°C . Host: *B. mori* L. Disease: Larvae died. Reference: Journal of Wuhan Univ. (Natural Science Edition), 1985, (2): 91–94. The Atlas of Insect Viruses in China, 89–91, 1986. Character: Stable at $\text{pH} 2.8-12$, 30% ethanol, ether. Virion containing 4 polypeptides; sDNA $\text{MW} = 27 \times 10^6$, Virion = 22nm.

Bombyx mori nuclear polyhedrosis virus

家蚕核型多角体病毒

Baculoviridae

AS-IV 1.0063

Source: Larvae, Haining, Zhejiang. Preparation: Larvae. Incubation: $25-27^{\circ}\text{C}$, 9 days. Effect: Larvae death. Storage: Freeze, -30°C . Host: *Bombyx mori* L. Disease: Larvae swelled, died. Reference: Acta Biochemica et Biophysica Sinica, 9 (3): 267–246, 1977. Acta Sericologica Sinica, 8 (3): 133–138, 139–144, 1982; 9 (1): 29–33, 1983. Character: Virion: $(83-90) \times (380-400)$ nm, Sw, 20=1870, DNA $\text{MW} = 82 \times 10^6$, Tm = $86-87^{\circ}\text{C}$, A, 29.3; G, 22.5; C, 20.2; T, 28.0; AT/GC = 1.34; G+C = 37.8%.

Bovine infectious rhinotracheitis virus

牛传染性鼻气管炎病毒

AS-IV 6.0002

Source: Rhinal cavity of milch cow, Shenzhen, Guangdong. Preparation: calf kidney cells. Incubation: 37°C , 3 days. Effect: CPE. Storage: Freeze-dried, -20°C . Host: calf kidney cells, ox. Disease: CPE. Reference: Acta Microbiologica Sinica 23 (3): 275–279, 1983. Character: The virion was typically spherical in shape 160–230nm in diameter. Its nucleocapsid was made up of a core 50–60nm and a capsid 100–110nm in diameter.

Bovine pseudorabies virus

耕牛伪狂犬病毒

Herpesviridae A

CVCC AV1211 * ← Fujian Veterinary Bioproduct Plant, China

= CVCC 1211=Strain Min A

Source: Brain tissue, Changtai County, Fujian. Usage: Production of vaccine. Preparation: Infected TC of HaK cells. Incubation: 37°C , 1 day. Effect: CPE. Storage: Freeze-dried, -80°C . Host: Bovine, sheep, goats, pigs, rabbits, mice, dogs, HK, RK, BK and CEF. Symptoms: Bovine pseudorabies. Reference: Acta Veterinaria et Zootechnica Sinica 9 (1): 21–30, 1966 (Chin). Character: HaK or RK inoculated with 1% (V/V) appears CPE after 24 hr; TCID₅₀ $\geq 10^{6.3}/0.1\text{ml}$; adult rabbits become ill and even dead when inoculated with 1ml (1:100000 dilution) subcutaneously; LD₅₀ $\geq 10^7/1\text{ml}$; stable virulence and good preservation.

Bovine rotavirus

牛轮状病毒

Rotavirus, Reoviridae

CVCC AV50 ← ATCC

= ATCC VR-917=C 486

Source: Saskatchewan. Preparation: TC of infected MA-104. Incubation: 37°C , 3–4 days. Effect: CPE. Storage: No freeze-dried, -75°C . Host: BSC-1, MA-104 cells. Symptoms: Diarrhea. Reference: J. Clin. Microbiol. 6: 610–617, 1977 (En); Can. J. Microbiol. 24: 353–356, 1978 (En). Character: Agglutinates human O and GP RBC.

Bovine viral diarrhoea virus

牛病毒性腹泻病毒

Pestivirus, Flaviviridae

CVCC AV67 ← AQI← National Animal Disease Laboratory, USA

= NADL

Source: Spleen, USA. Preparation: Infected TC supernate. Incubation: 37°C , 2–6 days. Effect: CPE. Storage: No freeze-dried, -70°C . Host: Cattle, rabbit, sheep, swine and BT cells. Symptoms: Bovine virus diarrhoea-mucosal disease.

Reference: Can. J. Com. Med. Vet. Sci. 27: 121, 1963 (En); Ibid. 28: 19-121, 1963 (En). Character: BVD viruses have cross-neutralization and cross-fluoresce with hog cholera viruses in serological tests.

CVCC AV68 * ← NCIVBP

=Strain Yak

Source: Blood, Aba Prefecture, Sichuan. Preparation: Infected TC of BK cells. Incubation: 3-5 days. Effect: No CPE. Storage: Freeze-dried, -80°C . Host: BK and BT cells. Symptoms: Bovine viral diarrhea. Character: No CPE in calf kidney and testicular cells; antibody titer from cattle immunized with infected cell culture is 1:64; viral titer for TC is lower than that with strain Oregon C24.

CVCC AV69 ← NCIVBP

=Strain Ba

Source: Spleen, USA. Usage: Vaccine and antigen production. Preparation: Infected TC of BK cell line. Incubation: 3-5 days. Effect: CPE. Storage: Freeze-dried, -80°C . Host: Pr BK, PrB testicular, Pr Pk and BT cell line. Symptoms: Bovine viral diarrhea-mucosal disease. Reference: J. Vet. Sci. and Techn. 9: 24-26, 1982; 1: 10-15, 1984 (Chin). Character: CPE; good immunity; no HA or hemolysin.

Buzura suppressaria nuclear polyhedrosis virus

油桐尺蠖核型多角体病毒

Baculoviridae

AS-IV 1.0010

Source: Larvae, Puqi, Hubei. Usage: Used as pesticide. Preparation: Infected larvae. Incubation: 25-27 $^{\circ}\text{C}$, 7 days. Effect: Larvae death. Storage: Freeze-dried 4, -30°C . Host: *Buzura suppressaria* G. Disease: Replicate in the nucleus, larvae swelled, died. Reference: Acta Virologica Sinica, 17-20, 1979. Acta Entomologica Sinica, 24(4): 372-377, 1981. Microbiology, 11(1): 2-3, 1984. Character: Virion=265 \times 70nm, dsDNA, $T_m=67^{\circ}\text{C}$, G+C%=32%, Sw, 20=35, MW=46.5 $\times 10^6$ d.

Calf rotavirus

犊牛轮状病毒

Rotavirus, Reoviridae

CVCC AV51 ← Zhengzhou Animal and Veterinary Training School, Henan, China.

=NCDV (Lincoln) =Nebraska calf diarrhea =Neonatal calf diarrhea Source: Intestinal contents, Nebraska, USA. Preparation: Infected TC of MA-104. Incubation: 35 $^{\circ}\text{C}$, 3-5 days. Effect: CPE. Storage: No freeze-dried, $\leq -60^{\circ}\text{C}$. Host: Fetal BK cells, GMK cells and MA-104 cells. Symptoms: Diarrhea. Reference: Can. Vet. J. 12: 69, 1971 (En); Arch. Gesamte Virus Forsch. 37: 114, 1972 (En); Can. J. Comp. Med. 37: 295, 1973 (En). Character: Attenuated strain.

CVCC AV52 * ← JAAS

=BRV014

Source: Diarrhea stool, Jieshou, Anhui. Preparation: Infected TC of MA-104. Incubation: 37 $^{\circ}\text{C}$, 5-7 days. Effect: CPE. Storage: No freeze-dried, $\leq -60^{\circ}\text{C}$. Host: Calf, MA-104 cells. Symptoms: Diarrhea. Reference: Chin. J. of Vet. Med. 1987, 13(9) (Chin). Character: Agglutinates RBC of guinea pig, sheep, goat, pig, cat, chicken, duck and pigeon. No HA with rabbit, hamster and mouse RBC. The strain was closely related to NCDV strain in antigenicity.

CVCC AV53 * ← JAAS

=BRV007=RV007

Source: Diarrhea stool, Jieshou, Anhui. Preparation: Infected TC of MA-104. Incubation: 37 $^{\circ}\text{C}$, 5-7 days. Effect: CPE. Storage: No freeze-dried, $\leq -60^{\circ}\text{C}$. Host: Calf, MA-104 cells. Symptoms: Diarrhea. Reference: Chin. J. of Vet. Med. 13(9) 1987, (Chin). Character: Agglutinates RBC of guinea pig, sheep, goat, pig, cat, chicken, duck and pigeon.

No HA with rabbit, hamster and mouse RBC. The strain was closely related to NCDV strain in antigenicity.

Catopsilia crocale densonucleosis virus

迁粉蝶浓核症病毒

Parvoviridae

AS-IV 1.0088

Source: Larvae, Jianfeng, Hainan. Preparation: Larvae. Incubation: 25-27 $^{\circ}\text{C}$, 4 days. Effect: Larvae death. Storage: Freeze, -30°C . Host: *Catopsilia crocale* C. Disease: Larvae died. Reference: The Atlas of Insect Viruses in China, p91, 1986, Hunan Science and Tech. Press. Character: Spherical virion, 19-22nm.

Catopsilia crocale nuclear polyhedrosis virus

迁粉蝶核型多角体病毒

Baculoviridae

AS-IV 1.0228

Source: Larvae, Jianfeng, Hainan. Preparation: Larvae. Incubation: 25-27 $^{\circ}\text{C}$, 4 days. Effect: Larvae death. Storage: Freeze, -30°C . Host: *C. crocale* C. Disease: Larvae festered, died. Reference: in Disinsectional Microorganism Vol. 3, p. 226. Division of Agriculture, Chinese Society of Microorganism, 1990. Huazhong Normal Univ. Press. Character: One or more nucleocapsids per envelope, polyhedra about 0.7-1.6 μ , rod-shap nucleocapsid about 52 \times 350 nm.

Chicken influenza A virus, A/Chick/Hubei/109/1978

鸡甲型流感病毒, A/鸡/鄂科/109/1978

AS-IV 6.0005

Source: Pharynx, cloaca, Hubei. Preparation: Uric juice of chicken embryo. Incubation: 38-39 $^{\circ}\text{C}$, 9 days. Effect: Pathological changes of chicken embryo. Storage: Freeze-dried, -20°C . Host: Chicken, chicken embryo. Disease: Pathological changes of Chicken embryo. Reference: Acta Virologica Sinica (3): 93-99, 1983. Character: The virus particles being varied form, about 80-120 nm in diameter. The nucleic acid of virus probably consists of single-stranded RNA.

Chicken influenza A virus, A/Chick/Hubei/119/1979

鸡甲型流感病毒, A/鸡/鄂科/119/1979

AS-IV 6.0006

Source: Pharynx, cloaca, Hubei. Preparation: Uric juice of chicken embryo. Incubation: 38-39 $^{\circ}\text{C}$, 9 days. Effect: Pathological changes of chicken embryo. Storage: Freeze-dried, -20°C . Host: Chicken, chicken embryo. Disease: Pathological changes of chicken embryo. Reference: Acta Virologica Sinica (3): 93-99, 1983. Character: The virus particles being varied form, about 80-120 nm in diameter. The nucleic acid of virus probably consists of single-stranded RNA.

Chicken influenza A virus, A/Chick/Hubei/120/1979

鸡甲型流感病毒, A/鸡/鄂科/120/1979

AS-IV 6.0007

Source: Pharynx, cloaca, Hubei. Preparation: Uric juice of chicken embryo. Incubation: 38-39 $^{\circ}\text{C}$, 9 days. Effect: Pathological changes of chicken embryo. Storage: Freeze-dried, -20°C . Host: Chicken, chicken embryo. Disease: pathological changes of chicken embryo. Reference: Acta Virologica Sinica (3): 93-99, 1983. Character: The virus particles being varied form, about 80-120 nm in diameter. The nucleic acid of virus probably consists of single-stranded RNA.

Chicken influenza A virus, A/Chick/Hubei/127/1979

鸡甲型流感病毒, A/鸡/鄂科/127/1979

AS-IV 6.0008

Source: Pharynx, cloaca, Hubei. Preparation: Uric juice of chicken embryo. Incubation: 38-39 $^{\circ}\text{C}$, 9 days. Effect: Pathological changes of chicken embryo. Storage: Freeze-dried, -20°C . Host: Chicken, chicken embryo. Disease:

Chicken influenza A virus, A/ Chick/ Hubei/ 127/ 1979 (Continued)

Pathological changes of chicken embryo. Reference: Acta Virologica Sinica (3): 93—99, 1983. Character: The virus particles being varied form, about 80—120 nm in diameter. The nucleic acid of virus probably consists of single-stranded RNA.

Chinese cabbage virus

中国大白菜病毒

AS-IV 2. 0005

Source: Leaves, Congming County, Shanghai. Preparation: Infected cabbage leaves. Incubation: 20°C, 14 days. Effect: Pathological changes. Storage: Freeze-dried, -30°C. Host: Nicotiana tabacum, Brassica pekinensis, etc. Disease: Appear brown necrosis spot in Brassica pekinensis. Reference: Acta Biochemica et Biophysica Sinica, No. 13 (2): 217—219, 1981. Character: Rod-shaped particle, 300×15 nm sap transmission.

Citrus tatter leaf virus

柑桔碎叶病毒

AS-IV 2. 0129

Source: Leaves, Huangyan, Zhejiang. Preparation: Infected citrus leaves. Incubation: 20—24°C, 60 days. Effect: Pathological changes. Storage: No freeze-dried 20—24°C. Host: Citrus reticulata, Citrus sinensis. Disease: Tatter leaves and mosaic and necrotic spot on Citrus reticulata, Citrus sinensis. Reference: Acta Phytopathologica Sinica, 18 (2): 80—84, 1988. Character: Rod-shaped, 400—900 nm, graft transmission.

Clania variegata nuclear polyhedrosis virus

大巢蛾核型多角体病毒

Baculoviridae

AS-IV 1. 0014

Source: Larvae, Shanghai. Usage: Used as pesticide. Preparation: Infected larvae. Incubation: 25—27°C, 10 days. Effect: Larvae death. Storage: 4, -30°C. Host: *Clania variegata*. Disease: Infected larvae swelled, died. Reference: Scientia Silvae Sinica, (4): 40—41, 1978. Chinese Journal of Biological Control, 1 (3): 13—15, 1985. Character: Virion = $(320 \pm 4.94) \times (94.6 \pm 1.55)$ nm, nucleocapsid = 233 × 33 nm.

Closteria anachoreta granulosis virus

杨扇舟蛾颗粒体病毒

Baculoviridae

AS-IV 1. 0031

Source: Larvae, Tianmen county, Hubei. Usage: Used as pesticide. Preparation: Infected larvae. Incubation: 25—27°C, 5 days. Effect: Larvae death. Storage: 4, -30°C. Host: *C. anachoreta* F. cross-infected, *C. anastomosis* L. Disease: Virus replicated in cytoplasm, larvae swelled, festered, died. Reference: Journal of Wuhan Univ. (Natural Science Edition), (1) 4: 127—128, 1979. Acta Virologica Sinica, 1983, Vol. 1: 223—231. Character: Granules = 360×195 nm, virion = 330×100 nm; one virion per granules. dsDNA Tm = 85°C, G+C = 38.3%, MW = 48.3×10^6 .

Closteria anastomosis granulosis virus

分月扇舟蛾颗粒体病毒

Baculoviridae

AS-IV 1. 0119

Source: Larvae, Anshun, Guizhou. Preparation: Larvae. Incubation: 25—27°C, 5 days. Effect: Larvae death. Storage: Freeze, -30°C. Host: *C. anastomosis* L. cross-infected, *C. anachoreta* F. Disease: Larvae swelled, died. Reference: Forest Science and Technology, 1981, (5): 23—24. Character: One nucleocapsid per granules, virion = $(200—433) \times (30—90)$ nm; viroins containing 21 polypeptides; dsDNA MW = 90×10^6 , Tm = 72.4°C, G+C = 45%.

Corynebacterium pekinense phage

北京棒杆菌噬菌体

AS-IV 3. C1 ← Research group of phage, Institute of Microbiology, Academia Sinica

= A2

Source: Fermentation liquid, Beijing. Usage: Preparing antigen and antibody, providing serum typing and identifying host. Preparation: Corynebacterium pekinense was disrupted by 3C1 Phage liquid. Incubation: 32°C, 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: Corynebacterium pekinense. Disease: Disrupt host. Reference: Acta Microbiologica Sinica 17 (3): 211—216, 1977. Character: 80°C inactivity sensitivity to chloroform.

AS-IV 3. C2 ← Research group of phage, Institute of Microbiology, Academia Sinica

= A3

Source: Fermentation liquid, Beijing. Usage: Preparing antigen and antibody, providing serum typing and identifying host. Preparation: Corynebacterium pekinense was disrupted by 3C2 phage liquid. Incubation: 32°C, 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: Corynebacterium pekinense. Disease: Disrupting host. Reference: Acta Microbiologica Sinica 17 (3): 211—216, 1977. Character: 80°C inactivity, sensitivity to chloroform.

AS-IV 3. C3 ← Research group of phage, Institute of Microbiology, Academia Sinica

= A133

Source: Fermentation liquid, Beijing. Usage: Preparing antigen and antibody, providing serum typing and identifying host. Preparation: Corynebacterium pekinense was disrupted by 3C3 phage liquid. Incubation: 32°C, 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: Corynebacterium pekinense. Disease: Disrupt host. Reference: Acta Microbiologica Sinica 17 (3): 211—216, 1977. Character: 80°C inactivity, sensitivity to chloroform.

AS-IV 3. C4 ← Department of chemistry, Jilin University.

= A519

Source: Fermentation liquid, Liaoyuan, Jilin province. Usage: Preparing antigen and antibody, providing serum typing and identifying host. Preparation: Corynebacterium pekinense was disrupted by 3C4 phage liquid. Incubation: 32°C, 0.75 days. Effect: Forming plaque. Storage: Freeze-dried, -10°C. Host: Corynebacterium pekinense. Disease: Disrupt host. Reference: Microbiology 10 (2): 55—56, 1983. Character: Sensitivity to chloroform.

Coxsackievirus A 1 (Tompkins)

柯萨奇病毒 A1 型

IB-CAM 035 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^\circ\text{C}$. Host: Primate. Symptoms: Aseptic meningitis, herpangina, pericarditis and myocarditis. Reference: Dalldorf G. et al J. Exp. Med. 89: 567, 1949. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in newborn mice.

Coxsackievirus A 2 (Fleetwood)

柯萨奇病毒 A2 型

IB-CAM 036 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antisera. Incubation: 37°C. Storage: Freeze, $\leq -20^\circ\text{C}$. Host: Primate. Symptoms: Aseptic meningitis, herpangina, pericarditis and myocarditis. Reference: Sickles, GM. et al: Proc. Soc. Exp. Biol. Med. 73: 30, 1949. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse. It produces characteristic CPE in RD cell and primary human amnion cell cultures.

Coxsackievirus A 3 (Olson)

柯萨奇病毒 A3 型

IB-CAM 037 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antisera. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Aseptic meningitis, herpangina. Reference: Sickles, G.M. *et al.*: Proc. Soc. Exp. Biol. Med. 72:30, 1949. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse. It produces characteristic CPE in RD cell and primary human amnion cell cultures.

Coxsackievirus A 4 (High Point)**柯萨奇病毒 A4 型**

IB-CAM 038 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antisera. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis, aseptic meningitis, hand-foot-and-mouth disease, epidemic myalgia, infantile diarrhea, herpangina, respiratory illness and pneumonia, pericarditis. Reference: Mehnick J. Bull. N. Y. Acad. Med. 26:342, 1950. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse. It produces characteristic CPE in RD cell and primary human amnion cell cultures.

Coxsackievirus A 5 (Swartz)**柯萨奇病毒 A5 型**

IB-CAM 039 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antisera. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis, aseptic meningitis, encephalitis, hand-foot-and-mouth disease, pericarditis, myocarditis, herpangina, and so on. Reference: Dalldorf, G. *et al.*: Diagnostic Proc. for Virus and Rickettsial Disease, 2nd Ed. Amer. Public Health Assoc. New York pp 153, 1956. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse. It produces characteristic CPE in RD cell cultures.

Coxsackievirus A 6 (Gdula)**柯萨奇病毒 A6 型**

IB-CAM 040 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antisera. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis, aseptic meningitis, encephalitis, epidemic myalgia, herpangina. Reference: Dalldorf, G. *et al.*: Diagnostic Proc. for Virus and Rickettsial Disease, 2nd Ed. Amer. Public Health Assoc. New York pp 153, 1956. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse. It produces characteristic CPE in RD cell cultures.

Coxsackievirus A 7 (Parker)**柯萨奇病毒 A7 型**

IB-CAM 041 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis, aseptic meningitis, encephalitis, hand-foot-and-mouth disease, herpangina. Reference: Chumakov, M. P. *et al.*: Problems of Virology 1: 16, 1956. Habel, K. *et al.*: Proc. Exp. Biol. Med. 95: 597, 1957. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death of mouse. It produces a flaccid paralysis in suckling monkey. It produces characteristic CPE in MK, RD and HEK cell cultures and agglutinates human type O erythrocytes.

Coxsackievirus A 8 (Donovan)**柯萨奇病毒 A8 型**

IB-CAM 042 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Aseptic meningitis, pericarditis and myocarditis. Reference: Dalldorf, G. *et al.*: Ann. N. Y. Acad. Sci. 56:583, 1953. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse. It produces characteristic CPE in RD cell and primary human amnion cell cultures.

Coxsackievirus A 9 (Bozek)**柯萨奇病毒 A9 型**

IB-CAM 043 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis, aseptic meningitis, encephalitis, hand-foot-mouth disease, epidemic myalgia, pancreatitis, infantile diarrhea, hepatitis, herpangina, respiratory illness. Reference: Dalldorf, G. *et al.*: Ann. N. Y. Acad. Sci. 56:583, 1953. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse. It produces characteristic CPE in monkey derived and human cell cultures.

Coxsackievirus A 10 (Nowalik)**柯萨奇病毒 A10 型**

IB-CAM 044 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis, hand-foot-and-mouth disease, epidemic myalgia, hepatitis, herpangina, respiratory disease, pericarditis, myocarditis, and so on. Reference: Dalldorf, G. *et al.*: Ann. N. Y. Acad. Sci. 56:583, 1953. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse. It produces characteristic CPE in human amnion cell and RD cell cultures.

Coxsackievirus A 11 (Belgium-1)**柯萨奇病毒 A11 型**

IB-CAM 045 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis, aseptic meningitis, epidemic myalgia. Reference: Godenne, M. *et al.*: Acad. Paed. Belgica 8: 29, 1954. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse. It produces characteristic CPE in primary human amnion cell cultures.

Coxsackievirus A 12 (Texas-12)**柯萨奇病毒 A12 型**

IB-CAM 046 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Unknown. Reference: Contreras, G. *et al.*: J. Immunol. 69: 395, 1952. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse. It produces characteristic CPE in RD cell and primary human amnion cell cultures.

Coxsackievirus A 13 (Flores)**柯萨奇病毒 A13 型**

IB-CAM 047 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Unknown. Reference: Sickles, G. M. *et al.*: Proc. Soc. Exp. Biol. Med. 90: 529, 1955. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse, and characteristic CPE in HeLa and

Coxsackievirus A 13 (Flores) (Continued)

primary human amnion cell cultures.

Coxsackievirus A 14 (G-14)

柯萨奇病毒 A14 型

IB-CAM 048 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Unknown. Reference: Sickles, G. M. *et al*: Proc. Soc. Exp. Biol. Med. 90: 529, 1955. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse, and characteristic CPE in RD cell and primary human amnion cell cultures.

Coxsackievirus A 15 (G-9)

柯萨奇病毒 A15 型

IB-CAM 049 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Unknown. Reference: Sickles, G. M. *et al*: Proc. Soc. Exp. Biol. Med. 90: 529, 1955. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse, and characteristic CPE in RD cell and primary human amnion cell cultures.

Coxsackievirus A 16 (G-10)

柯萨奇病毒 A16 型

IB-CAM 050 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Aseptic meningitis, infantile diarrhea, hand-foot-and-mouth disease, pericarditis, myocarditis, infantile pneumonitis, and so on. Reference: Sickles, G. M. *et al*: Proc. Soc. Exp. Biol. Med. 90: 529, 1955. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse, and characteristic CPE in RD cell and primary human amnion cell cultures.

Coxsackievirus A 17 (G-12)

柯萨奇病毒 A17 型

IB-CAM 051 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Aseptic meningitis and so on. Reference: Sickles, G. M. *et al*: Proc. Soc. Exp. Biol. Med. 90: 529, 1955. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse, and characteristic CPE in RD cell cultures.

Coxsackievirus A 18 (G-13)

柯萨奇病毒 A18 型

IB-CAM 052 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Aseptic meningitis, infantile diarrhea and so on. Reference: Sickles, G. M. *et al*: Proc. Soc. Exp. Biol. Med. 90: 529, 1955. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse, and characteristic CPE in primary human amnion cell cultures.

Coxsackievirus A 19 (Dohi)

柯萨奇病毒 A19 型

IB-CAM 053 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Herpangina and so on. Reference: Sickles, G. M. *et al*: Proc. Soc. Exp. Biol. Med. 90: 529, 1955. Character: It

produces widespread myositis of voluntary muscles and a flaccid paralysis in suckling mouse.

Coxsackievirus A 20 (IH-35)

柯萨奇病毒 A20 型

IB-CAM 054 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Infantile diarrhea and so on. Reference: Sickles, G. M. *et al*: Proc. Soc. Exp. Biol. Med. 102: 742, 1959. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse, and characteristic CPE in primary human amnion cell cultures.

Coxsackievirus A 21 (Kuykendall)

柯萨奇病毒 A21 型

IB-CAM 055 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis, infantile diarrhea, respiratory disease, common cold and so on. Reference: Sickles, G. M. *et al*: Proc. Soc. Exp. Biol. Med. 102: 742, 1959. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse, and characteristic CPE in primary human amnion cell cultures.

Coxsackievirus A 22 (Chulman)

柯萨奇病毒 A22 型

IB-CAM 056 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Aseptic meningitis, infantile diarrhea, herpangina, pericarditis, myocarditis, and so on. Reference: Sickles, G. M. *et al*: Proc. Soc. Exp. Biol. Med. 102: 742, 1959. Character: It produces widespread myositis of voluntary muscles and a flaccid paralysis or death in suckling mouse.

Coxsackievirus A 23 (Joseph)

柯萨奇病毒 A23 型 (ECHO 9 型)

IB-CAM 057 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Aseptic meningitis, paralysis disease, myocarditis and pericarditis, epidemic myalgia, exanthem, Guillain-Barre's syndrome. Reference: Ramos-Alvarez, M. *et al*: Proc. Soc. Exp. Biol. Med. 87: 655, 1954. Character: Its CPE appears on monkey kidney and human diploid cell cultures. It can be caused human RBC agglutination.

Coxsackievirus A 24 (Joseph)

柯萨奇病毒 A24 型

IB-CAM 058 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Acute hemorrhagic conjunctivitis, aseptic meningitis, infantile diarrhea, respiratory illness, common cold. Reference: Provide, WHO. p. 11. Geneva, 1968, Sickles, G. M. *et al*: Proc. Soc. Exp. Biol. Med. 102: 742, 1959. Character: It produces widespread myositis of voluntary muscles and flaccid paralysis or death in suckling mouse, and characteristic CPE in primary human amnion cell and HeLa cell cultures.

Coxsackievirus B 1 (Conn-5)

柯萨奇病毒 B1 型

IB-CAM 059 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis-like disease, aseptic meningitis, encephalitis,

epidemic myalgia, infantile diarrhea, encephalitis, myocarditis, respiratory tract diseases and pericarditis. Reference: Melnick JL *et al.*: Proc. Soc. Exp. Biol. Med. 71:344, 1949. Character: It caused focal myositis of voluntary muscles and a flaccid paralysis or death in newborn mice. It produces CPE in monkey kidney and HeLa cell cultures. It can cause human type O RBC agglutination.

Coxsackievirus B 2 (Ohio-1)

柯萨奇病毒 B2 型

IB-CAM 060 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis-like disease, aseptic meningitis, encephalitis, epidemic myalgia, infantile diarrhea, herpangina, respiratory tract disease *et al.* Reference: Melnick JL *et al.*: J. Exp. Med. 91:185, 1950. Character: It caused focal myositis of voluntary muscles and a flaccid paralysis or death in newborn mice. It produces CPE in monkey kidney and Hep-2 cell cultures.

Coxsackievirus B 3 (Conn-5)

柯萨奇病毒 B3 型

IB-CAM 061 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Aseptic meningitis, paralysis-like disease, encephalitis, epidemic myalgia, infantile diarrhea, encephalitis, pancreatitis, myocarditis and pericarditis *et al.* Reference: Melnick JL *et al.*: J. Exp. Med. 92:463, 1950. Character: It caused focal myositis of voluntary muscles and a flaccid paralysis or death in newborn mice. It produces CPE in monkey kidney and Hep-2 cell cultures. It has cross reaction with ECHO virus type 6.

Coxsackievirus B 4 (JVB)

柯萨奇病毒 B4 型

IB-CAM 062 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis-like disease, aseptic meningitis, pancreatitis, infantile diarrhea, herpangina, epidemic myalgia, myocarditis and pericarditis *et al.* Reference: Dalldorf G. Bull. N. Y. Acad. Med. 26:329, 1950. Character: It caused focal myositis of voluntary muscles in newborn mice. It produces CPE in monkey kidney and Hep-2 cell cultures.

Coxsackievirus B 5 (Faulkner)

柯萨奇病毒 B5 型

IB-CAM 063 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis-like disease, aseptic meningitis, encephalitis, epidemic myalgia, infantile diarrhea, diabetes, myocarditis, pericarditis, herpangina, hand-foot-mouth disease. Reference: Sickles G. M. *et al.*: Proc. Soc. Exp. Biol. Med. 88:22, 1955. Character: It caused focal myositis of voluntary muscles in newborn mice. It produces CPE in monkey kidney and Hep-2 cell cultures. It can be caused human type O RBC agglutination.

Coxsackievirus B 6 (Schmitt)

柯萨奇病毒 B6 型

IB-CAM 064 Denmark

Usage: Detection of specific antibody, preparation of antigen, preparation and standardization of antiserum. Incubation: 37°C. Storage: Freeze, $\leq -20^{\circ}\text{C}$. Host: Primate. Symptoms: Paralysis-like disease, aseptic meningitis, encephalitis, epidemic myalgia *et al.* Reference: Hammon W. *et al.*: Proc. Soc. Exp. Biol. Med. 03:164, 1960. Character: It caused focal myositis of voluntary muscles in newborn mice. It pro-

duces CPE in monkey kidney and Hep-2 cell cultures. It can cause human type O RBC agglutination.

Cucumber mosaic virus

黄瓜花叶病毒

AS-IV 2.0107

Source: Leaves, Jize County, Hebei. Preparation: Infected Cucumber leaves. Incubation: 22–24°C, 14 days. Effect: Pathological amaranticolor changes. Storage: Freeze-dried, -30°C . Host: *Nicotiana tabacum*, *Cucumis sativus*, *Lycopersicon esculentum*, *Chenopodium*. Disease: Chlorosis mosaic, necrosis, mottling. Reference: Shandong Agriculture Science, 1989. Character: Spherical particle, diameter, 28 nm, ssRNA, TIP: 65–70°C, DEP: 0.0001–0.00001, longevity: 4–5 days, aphid and sap transmission.

Cucumber mosaic virus—Banana strain

黄瓜花叶病毒—香蕉株

AS-IV 2.0006

Source: Leaves, Shipai, Guangzhou. Preparation: Infected tobacco leaves. Incubation: 25–28°C, 20 days. Effect: Pathological changes. Storage: Freeze-dried, -30°C . Host: Banana, *cucumis sativus*, *Nicotiana tabacum*, *Cucurbita pepo*, *Capsicum frute*. Disease: Yellow mosaic and ring sport in *Musa paradisiaca* var. *sapientum* and *Cucumis sativus*. Mosaic in *Nicotiana tabacum* and *Cucurbita pepo*. Reference: Journal of South China Agriculture College 4 (4): 43–48, 1983. Character: Spherical particle, diameter 26 nm, ssRNA.

Cucumber mosaic virus—Begonia strain

黄瓜花叶病毒—球根海棠株

AS-IV 2.0074

Source: Leaves, Beijing. Preparation: Infected tobacco leaves. Incubation: 22–26°C, 14 days. Effect: Pathological changes. Storage: Freeze-dried, -30°C . Host: Begonia, *Nicotiana tabacum*, *Datura stramonium*, *Solanum melongena*, *Vicia faba*. Disease: Leaf roll in Begonia. Reference: Study of Flowers Virus (1), p6–10, 1986. 9. Character: Spherical particle, diameter 30 nm, sap transmission.

Cucumber mosaic virus—Buckwheat strain

黄瓜花叶病毒—荞麦株

AS-IV 2.0096

Source: Leaves, Beijing. Preparation: Infected Buckwheat leaves. Incubation: 22–26°C, 14 days. Effect: Pathological changes. Storage: Freeze-dried, -30°C . Host: *Fagopyrum*, *Nicotiana tabacum*, *Datura stramonium*, *Vicia faba*, *Vigna sinensi*. Disease: Mosaic in *Fagopyrum*. Character: Spherical particle, diameter 30 nm, sap transmission.

Cucumber mosaic virus—CA strain

黄瓜花叶病毒—CA 株

AS-IV 2.0033

Source: Leaves, Wuhan, Hubei. Preparation: Infected tobacco leaves. Incubation: 22–26°C, 10 days. Effect: Pathological changes. Storage: Freeze-dried, -30°C . Host: *Arachis hypogaea*, *Chenopodium amaranticolor*, *Phaseolus mungo*, etc. Disease: Mosaic and chlorotic in *Arachis hypogaea*. Yellow spots on *Chenopodium amaranticolor*. Mosaic on *Nicotiana tabacum* and *N. clelandii*. Reference: Xu, Z. and Barneff-O. W. 1984. Plant Disease 68:386–389. Character: Spherical particle, TIP: 55–60°C, DEP: 0.01–0.001, longevity: 6–7 days, seed and sap transmission.

Cucumber mosaic virus—Capsicum fern leaf-necrotic strain

黄瓜花叶病毒—辣椒蕨叶坏死株

AS-IV 2.0003

Source: Leaves, Jilin. Preparation: Infected tobacco leaves. Incubation: 23–25°C, 9 days. Effect: Pathological changes. Storage: Freeze-dried, -30°C . Host: *Chenopodium amaranticolor*, *Nicotiana tabacum*, *Cucumis sativus*, *Vicia faba*. Disease: Necrotic spot in *Chenopodium amaranticolor*, systemic symptoms in *Cucumis sativus*, *Capsicum*, *Nicotiana*. Reference: Agricultural Science of Jilin Province 3:67–74,