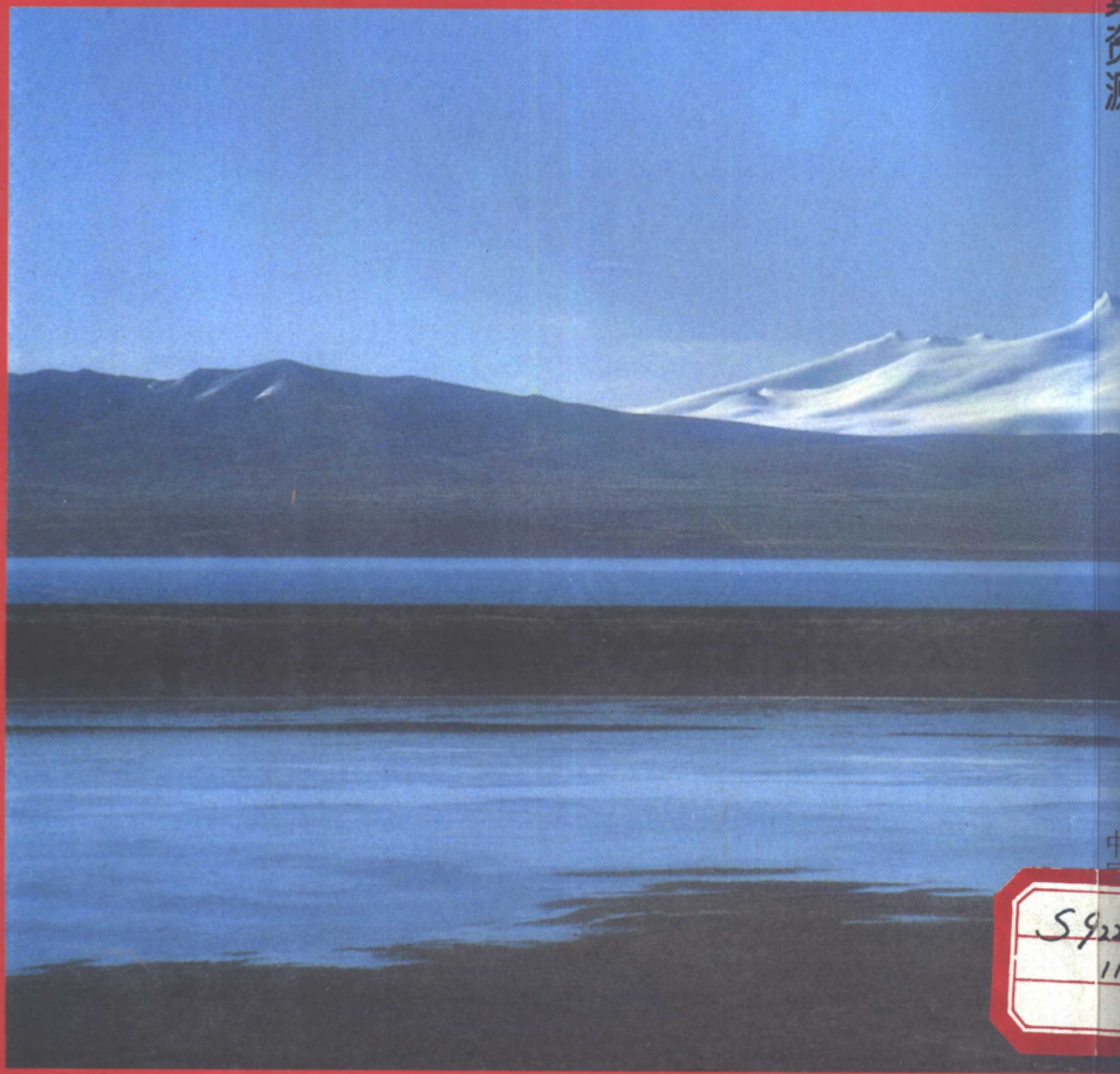
西藏鱼类及其资源

FISHES AND FISH RESOURCES IN XIZANG, CHINA

西藏自治区水产局　主编

中国农业出版社



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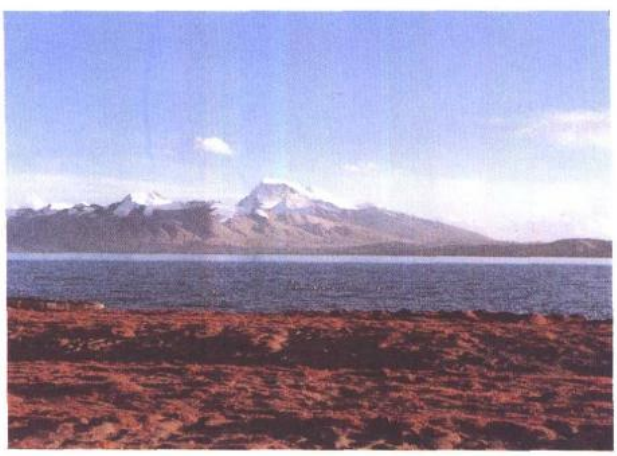

杨积庆赠

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西藏鱼类及其资源

西藏自治区水产局　主编

责任编辑　林珠英

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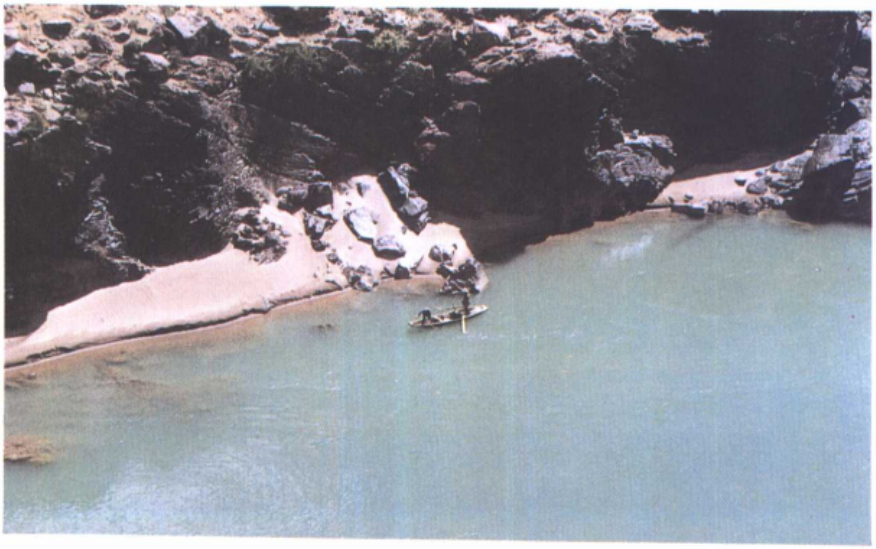
《西藏鱼类及其资源》为合理保护和合理开发利用水生资源的保护和合理开发利用提供了可靠的依据，必将为西藏的经济振兴和社会发展产生积极而深远的影响。

西藏自治区副主席 阿沛·晋美

一九九三年三月

1. 拉萨市布达拉宫后的“龙王潭”公园，潭内早年移入放养的红鲤鱼生长良好（海拔 3700m 左右）

2. 藏南亚东县亚东河，亚东鲑在该河段有分布（西藏自治区二级野生保护动物）



3. 枯水期的雅鲁藏布江中游，渔民正在江中捕鱼（海拔 3900m 左右）

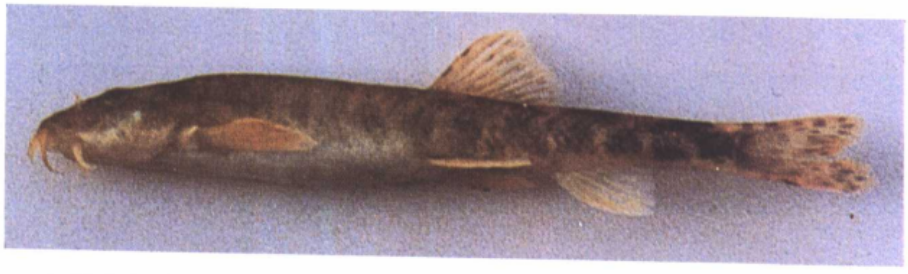
4. 亚东鲑

Salmon trutta fario Linnaeus，采自亚东县下司马

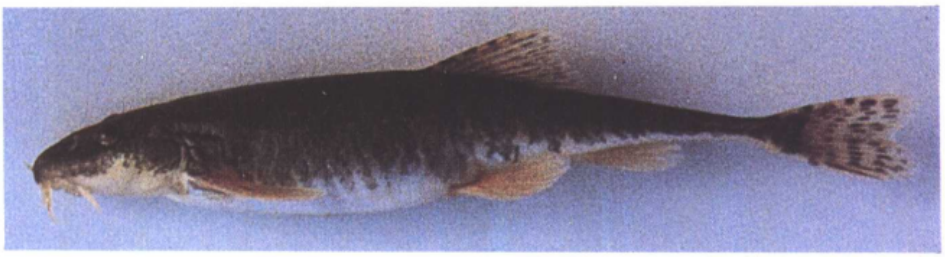
5. 东方高原鳅 *Triplophysa orientalis* (Herzenstein)，采自拉萨河

6. 西藏高原鳅 *Triplophysa tibetana* (Regan)，采自多雄藏布

7. 异尾高原鳅 *Triplophysa stewarti* (Hora)，采自年楚河

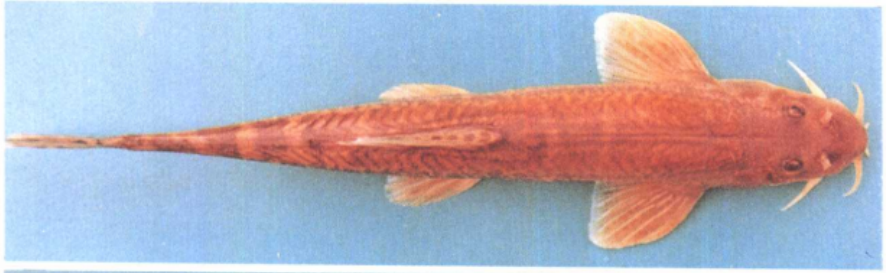


8. 斯氏高原鳅 *Triplophysa stoliczkae* (Steindachner)，采自雅鲁藏布江

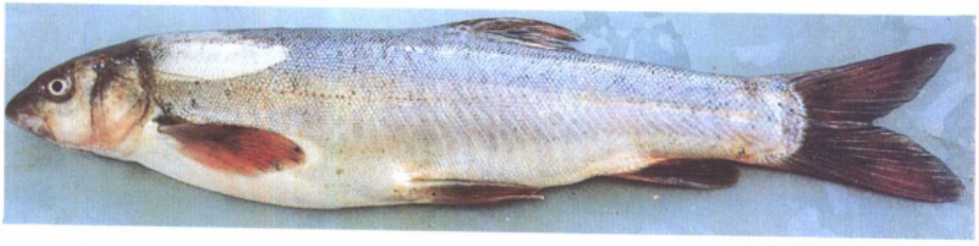


9. 细尾高原鳅 *Triplophysa stenura* (Herzenstein)，采自拉萨河

10. 墨脱四须鲃 *Barbodes hexagonolepis* (Mcllelland)，采自墨脱县



11. 圆腹高原鳅 *Triplophysa rotundirventris* (Wu et Chen)，采自安多县
（背、侧面观）



12. 异齿裂腹鱼 *Schizothorax o' connori* Lloyd，采自拉萨市

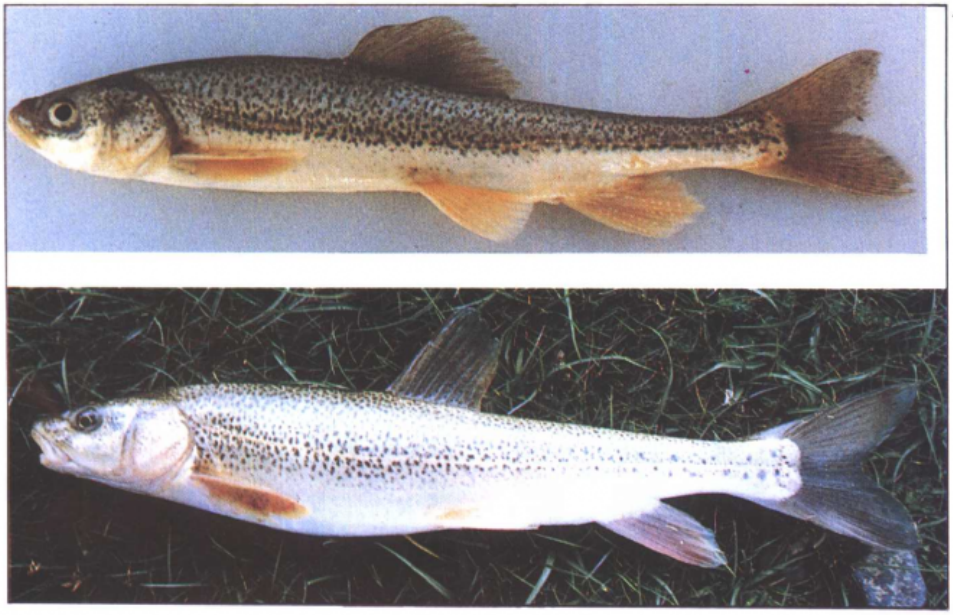
13. 怒江裂腹鱼 *Schizothorax nukiangensis* Tsao，采自左贡县

14. 光唇裂腹鱼 *Schizothorax lissolabiatus* Tsao，采自察隅县

15. 双须叶须鱼 *Ptychobarbus dipogon* (Regan)，采自萨嘎县

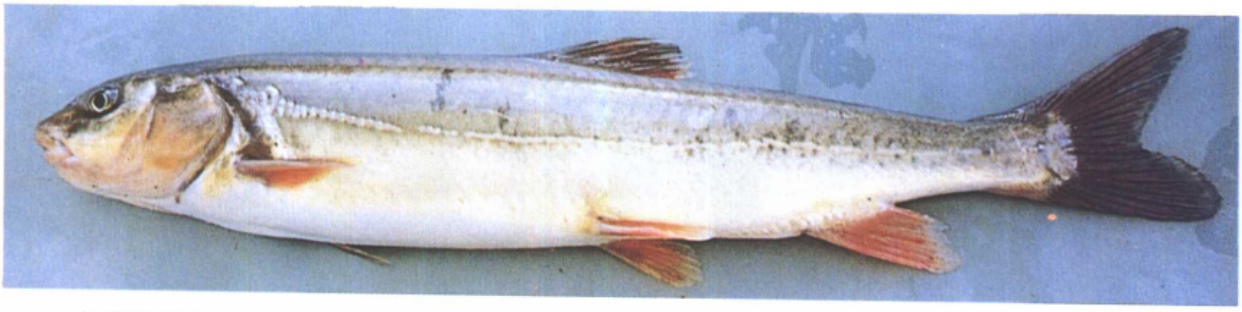
16. 裸腹叶须鱼 Ptychobarbus kaznakori Nikolsky，采自八宿县

17. 高原裸鲤 *Gymnocypris waddellii* Regan，采自羊卓雍错



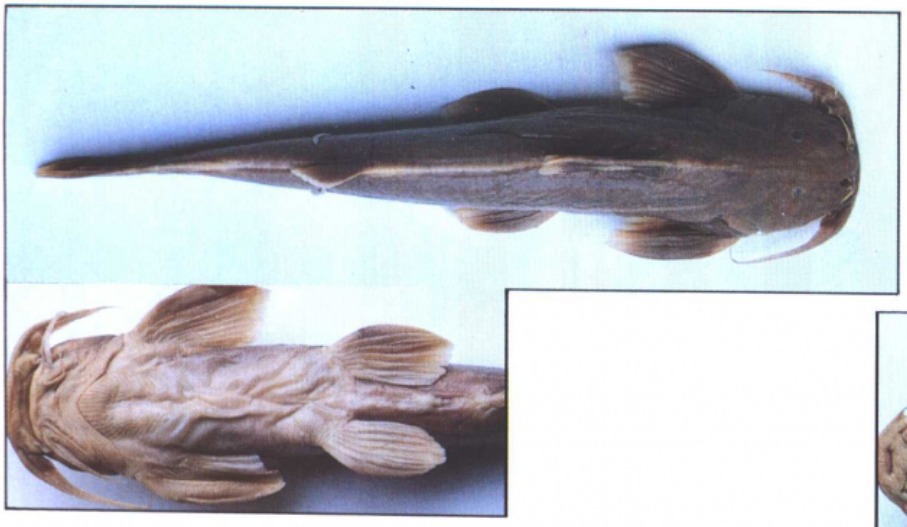
18. 软刺裸鲤 *Gymnocypris dobula* Günther，采自佩枯错（上图为雄性，下图为雌性）

19. 尖裸鲤 *Oxygymnocypris stewartii* (Lloyd)，采自日喀则市

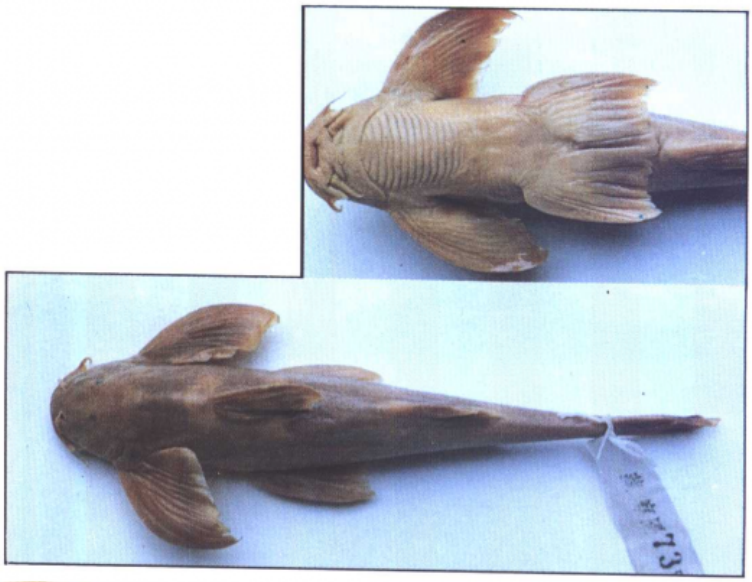


20. 拉萨裸裂尻鱼指名亚种 *Schizopygopsis younghusbandi younghusbandi* Regan，采自拉萨河

21. 拉萨裸裂尻鱼喜马拉雅亚种 *Schizopygopsis younghusbandi himalyensis* Tsao，采自聂拉木河



22. 墨脱纹胸鮡 *Glyptothorax anandalei* Hora，采自墨脱县（下图为腹面观）



23. 黄斑褶鮡 *Pseudecheneis sulcantus* (Mclland)，采自察隅沙马（上图为腹面观）

24. 黑斑原鮡 *Glyptosternum maculatum* (Regan)，采自谢通门县

彩图除 25 由陈毅峰提供外，其余由张春光、蔡斌摄

25. 藏鲟 *Exostoma labiatum* (Mcllelland)

26. 小头高原鱼 *Herzensteinia microcephalus* (Herzenstein)，采自札加藏布

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蔡　斌（西藏自治区水产局）

西藏鱼类资源及其保护利用、西藏经济鱼类种类及其分布、20余种鱼类的形态描述、附录及参考文献

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DIVISION OF COMPILATION:

Zhang Chunguang (Institute of Zoology, Chinese Academy of Sciences, Beijing, China):

Outline History of Ichthyology, Ichthyofauna with a Discussion of Zoogeography, Divition of Fishery Areas, Conservation Species and Areas of Precious and Rare Fishes, Classification, Description of Some Species, Reference, English Contents and Colour Illustration.

Cai Bin (Bureau of Aquartic Products, Tibet, China):

Resources of Fishes with a Discussion of their Conservation and Reasonable Utilization, Commercial Fishes and their Distribution, Description of Some Species and Reference.

Xu Taoqing (Institute of Zoology, Shannxi Province, China):

Natural Geography, Commercial Fishes and their Distribution, Outline History of Fishes, Conservation Species and Area of Precious and Rare Fishes, Morphology and Description of Some Species and Reference.

内 容 简 介

本书主要根据作者多年大量实地调查所取得的第一手资料，并结合有关文献记载编著而成。总论包括西藏自然地理概况、西藏鱼类研究简史、西藏鱼类动物地理学特征分析、西藏鱼类种类及其分布、西藏鱼类资源及其保护利用、西藏渔业区划、西藏珍稀保护鱼类、形态术语说明等；各论对西藏地区所产 71 种和亚种鱼类逐一做了较详细的形态描述，并扼要介绍了它们的生态和经济价值等。编有目、科、属及种的检索表，每种还配有附图和分布图，以便查阅。书后附有淡水鱼类调查方法及参考文献等。

本书可供综合性大学和师范院校有关生物或动物专业的师生，以及从事农业、水产和动物学科研、生产和管理的有关人员参考使用。

前　言

西藏自治区位于祖国的西南边陲，位于 78.4°－99.0°E，26.9°－36.5°N，面积 1200 000 多 km^2。境内的喜马拉雅山、冈底斯山、念青唐古拉山、昆仑山及唐古拉山，自南至北，东西横亘；雅鲁藏布江由西向东流经本区南部；著名的澜沧江、怒江、金沙江则由北向南蜿蜒于藏东南，形成了世界著名的高山峡谷区，海拔仅百余米的国境线附近属于热带、亚热带气候，深受印度洋暖湿气流的影响，雨量充沛，年降雨量达 2500mm－5000mm，是我国年降雨量最丰富的地区之一。北部和西北部地势高亢，面积辽阔，湖泊星罗棋布，高大山原间有许多宽谷盆地，平均海拔在 4000m 以上，雨量稀少，气候寒冷干旱，是西藏的草原和荒漠化草原区。独特、复杂的地形地貌记载着高原万古千秋的沧桑巨变。在这块奇特而又年青的高原上，生息、繁衍着多种多样的生物，高原上的鱼类也以其独具的特征世世代代栖息在“世界屋脊”。

近一个世纪以来，中、外科学家对西藏的鱼类进行了多次卓有成效的调查研究。特别是新中国成立以后，党和政府十分重视西藏地区的科学研究，多次组织对西藏高原进行大规模的多学科的综合考察，取得了一大批有较高学术价值和实用价值的科研成果。尤其是我国一些鱼类学工作者对西藏地区的鱼类进行了卓有成就的考察研究，为我们进一步深入研究和合理开发利用及保护西藏的鱼类资源，也为本书的编著打下了极好的基础。

1992 年在农业部水产司的关怀和支持下，由西藏自治区农牧林业委员会领导，西藏自治区水产局主持，陕西省动物研究所、中国科学院动物研究所参加，共同组成了西藏鱼类资源考察小组，于 1992 年至 1994 年对西藏自治区全区进行了大面积鱼类资源考察。三年来，在 1200 000km^2 的高原上，行程近 40 000km，选点采集 400 多次，获得鱼类标本近万号，经整理研究，并结合前人的工作，确认西藏现有鱼类 71 个种和亚种，隶属 3 目 5 科。其中发现 1 个新种。

在前人工作的基础上，结合我们获得的大量第一手材料，经共同讨论，分工撰写，由中国科学院动物研究所张春光副研究员负责汇总、修改、定稿；在此过程中，西藏自治区水产局蔡斌协助做了大量汇总、修改工作。《西藏鱼类及其资源》一书比较详细地记载和描述了西藏鱼类的形态特征、生态习性及经济意义；在大量试捕及多年渔业统计的基础上，提出了西藏鱼类资源的储量及保护利用对策；根据西藏区域自然地理特征和鱼类分布特点，进行了渔业区划；提出了西藏自治区地方性珍稀保护鱼类的种类及保护区。该书资料翔实、内容丰富，有较高的科学性和实用价值。

在进行西藏鱼类考察及其成果总结的工作中，中国科学院院士、中国科学院副院长陈宜瑜研究员和中国鱼类学会理事长、中国科学院水生生物研究所曹文宣研究员对我们的整个工作都给予了热情的关怀和具体的指导，特别是曹文宣研究员对书面总结材料进行了认真的审阅和修改；中国科学院南京地理与湖泊研究所朱松泉研究员、中国科学院水生生物研究所陈毅峰副研究员等对我们的工作给予了很多具体的支持和帮助；西藏自治区副主席泽仁桑珠、西藏自治区农委主任于学林、副书记傅元春、副主任林大武、原西藏自治区农委副主任姚培智、西藏自治区农委计财处处长方逢礼、副处长戴永奋以及各有关部门其他同志对我们的工作也给予了极大的关心和支持；野外考察期间，还得到了西藏各地（市）、县有关部门的大力配合和支持，西

藏自治区乡镇企业管理局苗青同志曾参加了部分野外考察。在此一并表示深深地谢意。

编著出版该书的目的是期望能为合理开发利用和保护西藏的鱼类资源提供科学依据，使其为西藏经济建设服务。但由于编写时间较短，有些内容还有待进一步充实，加之我们水平有限，书中会存在一些缺点和不足，恳请读者批评指正。

西藏自治区乡镇企业管理局(水产局)局长　彭仕盛

FISHES AND FISH RESOURCES IN XIZANG, CHINA

Xizang (Tibet) Autonomous Region (78. 4°—99°E, 26. 9°—36. 5°N) is located in Southwestern part of China. It includes the higest part of Qinghai—Xizang Plateau and its average altitute is over 4000m above sea level, so that it is called "the Third Pole on the Earth". Covering an area of 1 200 000 km^2, with a diversified geomorphology and complicated physical environment, the landform is of great difference and the climate varies in different regions. There are Himalaya, Gangdise, Nyainqentanglha, Kunlun and Tanggula Mountains from the south to the north; many great rivers, such as Changjiang, Lancangjiang, Nujiang, Irrawaddy, Yarlung Zangbo, Indus Rivers, etc. and some interior waters, such as Nam Co, Silling Co, Banggong Co, Yamzhon Yum Co, Maphamyum Co Lakes, etc. in Asia and on the earth rise or flow here.

The former research work is reviewed in the book. Since 1864, many Chinese and western scholars have been making intensive and deep investigations on fishes in the region. Especially some Chinese ichthyologists made excellent investigations on the fauna, biogeography, ecology, etc. of the fishes in Xizang in recent 30 years (Cao Wenxuan, 1964 and 1981 and Wu Yunfei, 1984).

According to our collections made in Xizang in last five years and other works, there are 57 species and 14 subspecies belonging to 3 orders, 5 families and 4 subfamilies, 22 genera of fresh—water fishes in Xizang are recognized. Among them are 25 species and 14 subspecies from 7 genera in known 11 genera, or 54. 9% of the total, of Schizothoracinae of Cyprinidae in China; 16 species, or 22. 5%, of Noemachilinae of Cobitidae; 11 species, or 15. 5%, of Sisoridae. All mentioned species or subspecies constitute over 93% of the total in the ichthyofauna of Xizang. Schizothoracinea ranked in the first both number and stocks. Only 5 species belongs to other groups such as Barbinea, Labeoninea and Psilorhynchidae, and they constitute only about 7% of the total (Table 1).

Composition of ichthyofauna presents also a great difference among different water bodys and altitutes (Tables 1 and 2). The fishes in the groups of schizothoracines and *Tryplophysa* distribute mainly in the higher altitude area and the fishes in other groups distribute mainly in the lower altitude area of the Southeast in Xizang. As the fishes of Schizothoracinae evolutionarily, the privitive group, such as the genus *Schizothorax* and the middle evolutionary groups, such as the genera *Aspiorhynchus*, *Ptychobarbus* and *Gymnodiptychus* live mainly in the current waters; and the highest evolutionary groups, such as *Gymnocypris* ,is mainly in the interior lakes, *Oxygymnocypris* and *Schizopygopsis* , are mainly in current waters belonging to both interior and outflow waters. The fishes in genus *Tryplophysa* distribute more widely on the plateau than the schizothoracines and even

can be fond in some lakes and streams over 5200m above the sea level and in some thermal springs. Most fishes of Sisoridae appear mainly in the current waters of eastern and southeastern areas in Xizang, only three species of the group distribute upward in the middle Yarlung Zangbo River and the source of Lancangjiang River.

The overall phenetic similarities of schizothoracines, the descrimination and the cluster analysis of average faunal resemblance (AFR, Table 3) indicate that 1) at the level of genus, the distribution center is formed from Changjiang River to upper reaches of Indus River (including interior waters near the rivers) except for Irrawaddy and lower reaches of Yarlung Zangbo River, the average faunal resemblance of the genus between the main waters in the area was over 80% and there were the genera shared with other waters out of the center in other distribution area; 2) at the level of species, two subregions were noticed: the center of Changjiang River included the region from Yellow River to lower reaches of Yarlung Zangbo River and the second was in middle—upper reaches of Yarlung Zangbo to Illy Rivers, the same species can be found among the waters in inner of every subregion, but there was a clear separation of the species distribution between the two subregions; 3) a new subspeciation center of schizothoracines was formed in the waters from middle—upper reaches of Yarlung Zangbo River to upper reaches of Indus River (including interior waters near them), almost all species in the evolutionary group of the subfamily, such as *Gymnocypris* and *Schizopygopsis* , became polytypic species and some of them even formed over 3 or 4 subspecies (Tables 1 and 2).

The new quicke uplift of Qinghai—Xizang Plateau and changes of environment would be the main reasons caused the subspeciation since the late Pleistocine (about 40 000—50 000 years). The geographical separation caused by the uplift and the change of climate. Rapid descent of water level in some lakes was noticed during our field works on the plateau. The water level of many lakes here would have been dropped 50—70m on average according to relative references and our directly survey.

The changes on relation among the waters in the Southern Qinghai—Xizang Plateau would also have been making mainly since the upstream erosion in the southern hill of the Plateau is accelerated after the temperate and moist current from Indian Ocean is stoped by the great plateau. Presumably it was the main reason cuased the changes of distribution areas of schizothoracines in the late Pleistocine period.

There was a long history of fishery in Xizang according to records and our surveys. Among all fishes in Xizang, more than local 20 species are of highly economical values. The fish catch has been increasing for last 10 years. Total annual catch in 1994 was estimated over 1 000 t. But the stocks of fish have been reduced in areas around the main cities, such as Lhasa, Zetang, Nyingchi Cities. We suggested about ten fish species and two protected areas (the Protected Areas of Upper Stream of Lhasa River and God Lake——Maphamyum Co Lake) of conservation value in the book.

According to the composition and the distribution of the fishes and the features of regional geography in Xizang, three first class regions and five subregions are classified . They