

DISTRIBUTION OF FRESHWATER FISHES IN BALOCHISTAN PROVINCE OF PAKISTAN

M. RAMZAN MIRZA AND M. SHAFIQ AHMED

Department of Zoology, G.C. University (MRM) and Punjab University (MSA) Lahore, Pakistan

Abstract: There are 68 species of freshwater fishes (excluding exotic species and marine species entering freshwater along the Makran coast) known from Balochistan province of Pakistan. They belong to 41 genera, 16 families and 9 orders of teleostean fishes. Their distribution in Balochistan is discussed. The distribution of genera, families and orders in various ichthyogeographical provinces viz: Gedrosia, Yaghistan and Mehran are tabulated. The fish fauna is richest in Mehran province and poorest in Gedrosia.

Key words: Freshwater fishes, Balochistan, Pakistan, Gedrosia, Yaghistan, Mehran, Ichthyogeography.

INTRODUCTION

Balochistan is the largest province of Pakistan. Its area is approximately 350,000 km² (Gils and Baig, 1992). Its fish fauna was studied by McClelland (1842), Day (1880), Gunther (1889), Zugmayer (1912-13), Mirza (1972) and many others. Some additions were made by Nazneen *et al.* (1989), Nazneen and Begum (1993), Coad (1996) and Ahmad *et al.* (1997). There are 68 freshwater native species of fishes belonging to 41 genera, 16 families and 9 orders of teleostean fishes. Several marine species enter into the streams and rivers in the coastal areas for the shorter and longer distances. Since the present paper deals with the zoogeographical aspects, the exotic and marine species of fishes are not taken into consideration. Among the ichthyogeographical provinces recognized by Mirza (1994) three provinces: Gedrosia, Yaghistan and Mehran are represented in Balochistan.

SYSTEMATIC ACCOUNT

ORDER OSTEOGLOSSIFORMES

FAMILY NOTOPTERIDAE

1. *Chitala chitala* (Hamilton)
This species is rarely found in the Hab and Porali rivers
2. *Notopterus notopterus* Pallas
This species also is rarely found in the river Hab.

ORDER CLUPEIFORMES**FAMILY CLUPEIDAE**

3. *Gudusia chapra* (Hamilton)

This species was reported from Lasbela by Zugmayer (1913).

ORDER CYPRINIFORMES**FAMILY CYPRINIDAE****Subfamily Cultrinae**

4. *Chela cachius* (Hamilton)

This small fish is found in the rivers Nari and Bolan.

5. *Salmophasia bacaila* (Hamilton)

This beautiful fish is widely distributed in the streams and rivers in eastern side of Balochistan, east of central Brahui and Hala ranges. It has been recorded from the river Zhob by Shahjehan and Jan (2001). Its record from Lasbela by Zugmayer (1913) is doubtful.

Subfamily Rasborinae

6. *Barilius modestus* (Day)

This species has been recorded from the river Zhob.

7. *Barilius pakistanicus* Mirza and Sadiq

This species is widely distributed in eastern rivers from Zhob to Kolachi.

8. *Barilius vagra* (Hamilton)

This species also is widely distributed in the eastern parts of Balochistan.

9. *Devario devario* (Hamilton)

This species has been recorded from rivers Porali and Hab and also from the rivers of Sindh-Balochistan hills.

10. *Rasbora rasbora* (Hamilton)

This is a rare species and has been recorded from Hab River only (Nazneen and Begum, 1997).

Subfamily Aspidoparinae

11. *Aspidoporia morar* (Hamilton)

This species is widely distributed in southern and southeastern parts of Balochistan and also in adjoining coastal areas of southeastern Iran.

Subfamily Barbinae

12. *Cirrhinus mrigala* (Hamilton)

This is found in the streams and rivers of Sindh-Balochistan hills

13. *Cirrhinus reba* (Hamilton)

This species also is found in Sindh-Balochistan hilly areas.

14. *Cyprinion microphthalmus* (Day)

This species is mainly distributed in the western Balochistan. It also extends into Iran and Afghanistan.

15. *Cyprinion milesi* (Day)

This species is also mainly distributed in the western Balochistan, west of central Brahui-Hala ranges. It extends into Iran also.

16. *Cyprinion watsoni* (Day)
This is the commonest species of the genus. It extends into the hilly areas of NWFP, Sindh, Punjab and Azad Kashmir.
17. *Gibelion catla* (Hamilton)
This is a rare species in Balochistan. It has been recorded from the river Bolan only (probably transplanted) by Mirza and Naik (1967).
18. *Labeo caeruleus* Day
This species is found in the Sindh-Balochistan hilly areas.
19. *Labeo calbasu* (Hamilton)
This species has been recorded from Bolan River by Siddiqi (1962).
20. *Labeo diplostomus* (Heckel)
This species is widely distributed in the eastern Balochistan from the river Zhob upto Hab River. It has also been recorded from rivers Porali, Hingol and Rakhshan as *Labeo dero*.
21. *Labeo dyocheilus pakistanicus* Mirza and Awan
This species is distributed in the rivers Zhob, Nari, Bolan, Kolachi etc. It is not found in the areas west of central Brahui Range. It has not been collected from the coastal areas.
22. *Labeo gedrosicus* Zugmayer
This species is endemic to Mashkhel drainage system of the north-western Balochistan. It was described by Zugmayer in 1912. Since then it has never been collected.
23. *Labeo macmahoni* Zugmayer
The status of this species is uncertain. A new subgenus *Tariqilabeo* was created by Mirza and Saboohi (1990) to accommodate this species. According to Kullander *et al.* (1999), it is a synonym of *Crossocheilus diplocheilus* (Heckel).
24. *Labeo rohita* (Hamilton)
This species was recorded by Day (1880) from rivers of Sindh-Balochistan hills. It is not found in the western Balochistan.
25. *Naziritor zhobensis* (Mirza)
This is the Zhobi Mahseer. It was described as *Tor zhobensis* by Mirza (1967) from river Zhob. Its range was extended to the rivers Kunder, Gomal, Shahur, Tochi, Kurram and Kabul. It has not been recorded from Sindh, Punjab and Azad Kashmir. It is thus endemic to Balochistan and NWFP. Its biology has not been properly studied.
26. *Puntius conchoni* (Hamilton)
This species has been recorded from southeastern Balochistan. Along the coastal areas it has been recorded from Lasbela by Nazneen *et al.* (1989) and from Hab by Nazneen and Begum (1993).
27. *Puntius punjabensis* (Day)
It has been recorded in Balochistan from Lasbela only by Zugmayer (1913).

28. *Puntius sophore* (Hamilton)

This species is quite common in eastern Balochistan and coastal areas. It has been recorded from Lasbela and Basol stream near Pasni as *Barbus stigma* by Zugmayer (1913), and from the river Bolan by Siddiqi (1962) etc.

29. *Puntius terio* (Hamilton)

It has been reported from rivers/streams of Sindh-Balochistan hills by Day (1880).

30. *Puntius ticto* (Hamilton)

This species has also been recorded from rivers/streams of Sindh-Balochistan hilly areas.

31. *Systomus sarana* (Hamilton)

It has been collected from the river Bolan and Sindh-Balochistan hills.

32. *Tor macrolepis* (Heckel)

It is the famous Golden Mahseer of Pakistan, Afghanistan and India. It was wrongly reported as *Tor putitora* (Hamilton) from Pakistan, Kashmir and the Indus system in India. It was recognized as a subspecies: *Tor putitora macrolepis* (Heckel) by Mirza and Bhatti (1996) and *Tor macrolepis* (Heckel) by Mirza (2003).

Subfamily Garrinae

33. *Garra gotyla* (Gray)

This species is found in the rivers Zhob, Nari, Bolan and Kolachi in the eastern Balochistan. It has not been collected from the western Balochistan.

34. *Garra rossica* (Nikolsky)

This is a small sized fish which is restricted to the northwestern Balochistan (Lora-Pishin and Maskkhal drainage systems). Its record from the river Kunder by Mirza *et al.* (1994) is doubtful.

35. *Crossocheilus diplocheilus* (Heckel)

This is the most widely distributed species in almost all the drainage systems in Pakistan and extended into Afghanistan and Iran.

Subfamily Schizothoracinae

This is the subfamily restricted to the northwestern Balochistan in the rivers Kunder, Zhob, Nari and Bolan only. Only three species of this subfamily, viz; *Racoma labiata*, *Schizocypris brucei* and *Schizothorax plagiostomus* are found in Balochistan. The record of *Schizopygopsis stoliczkae* from Ziarat valley was due to wrong identification of *Schizocypris brucei*. *Schizopygopsis stoliczkae* Steindachner in Pakistan is found only in the Northern Areas (Baltistan).

36. *Racoma labiata* McClelland and Griffith

This species is distributed in headwaters of the river Zhob, Nari and Bolan only.

37. *Schizocypris brucei* Regan

This snow-carp is distributed in the headwaters of Zhob, Kunder, and Nari rivers (Ziarat valley and Shah karez).

38. *Schizothorax plagiostomus* Heckel

This widely distributed snow carp species has been recorded from the head waters of Zhob, Nari and Bolan rivers.

FAMILY COBITIDAE

39. *Botia birdi* Chaudhuri

It has been recorded from the rivers Zhob, Nari, Bolan, Kolachi, Mula and other water bodies in the eastern Balochistan.

FAMILY NEMACHEILIDAE

40. *Acanthocobitis botia* (Hamilton)

This beautiful loach is distributed in the rivers Zhob, Nari, Bolan Kolachi and Hab.

41. *Nemacheilus corica* (Hamilton)

This species has been recorded from the river Zhob by Mirza *et al.* (1994).

42. *Schistura anambarensis* (Mirza and Banarescu)

This species has been recorded from the river Anambar (Loralai District) and Sasol stream (Khuzdar District).

43. *Schistura arifi* Mirza and Banarescu

This loach is endemic to river Zhob.

44. *Schistura balochiorum* (Zugmayer)

This loach has been collected from Panjgur and Harnai

45. *Schistura harnaiensis* (Mirza and Nalbant)

This loach has been described from Harnai. It is very closely related to *S. balochiorum*.

46. *Schistura kessleri* (Gunther)

This loach is widely distributed in western Balochistan.

47. *Schistura machensis* (Mirza and Nalbant)

It has been collected from Mach (Bolan river drainage) and Harnai (Nari river drainage). It is endemic to Balochistan.

48. *Schistura pakistanicus* (Mirza and Banarescu)

It is found in rivers Zhob, Kunder and Gomal. It appears to be endemic to Gomal drainage system.

49. *Triplophysa brahui* (Zugmayer)

This loach is endemic to the Lora-Pishin River in Pakistan and Afghanistan.

ORDER SILURIFORMES

The catfishes are only found in the eastern Balochistan. This order is completely absent in the western Balochistan, west of the central Brahui-Hala ranges.

FAMILY BAGRIDAE

50. *Rita rita* (Hamilton)

This species has been recorded from the rivers Bolan and Mula only.

51. *Mystus cavasius* (Hamilton)

This species has been recorded from Bolan River only.

52. *Mystus gulio* (Hamilton)

This catfish is partly marine. It was recorded from Lasbela by Zugmayer (1913).

53. *Sperata sarwari* Mirza, Nawaz and Javed
This valuable species was recorded from river Bolan as *Mystus seenghala* by Siddiqi (1962).

FAMILY SILURIDAE

54. *Ompok pabda* (Hamilton)
This species has been collected from southeastern Balochistan.
55. *Wallago attu* (Schneider)
This is the famous mullee. It has been recorded from southeastern part of Balochistan.
Its record from Lora-Pishin by Zugmayer (1913) is not correct.

FAMILY AMBLYCIPITIDAE

56. *Amblyceps macropterus* Ng
It was recorded as *Amblyceps sp.* from the river Gaj by Day (1880). It has now been described as *Amblyceps macropterus* by Ng (2001).

FAMILY SISORIDAE

57. *Glyptothorax naziri* Mirza and Naik
It has been collected from rivers Zhob and Anambar.
58. *Glyptothorax punjabensis* Mirza and Kashmiri
This species has been collected from river Zhob only.

ORDER BELONIFORMES

FAMILY BELONIDAE

59. *Xenentodon cancila* (Hamilton)
It has been recorded from Sonmiani by Ahmad *et al.* (1997).

ORDER CYPRINODONIFORMES

FAMILY APLOCHEILIDAE

60. *Aplocheilus panchax* (Hamilton)
This species was recorded from southeastern part of Balochistan in the river Nulli-ni (Day, 1880).

FAMILY CYPRINODONTIDAE

61. *Aphanius dispar* (Ruppell)
It is widely distributed in the southeastern part of Balochistan and extends into coastal areas reaching Panjgur.

ORDER CHANNIFORMES

FAMILY CHANNIDAE

62. *Channa gachua* (Hamilton)

This is widely distributed in southeastern Balochistan and the coastal areas. It extends into the river Pakhshan and southeastern Iran.

63. *Channa marulia* (Hamilton)

It is restricted to the Nari and Bolan rivers.

64. *Channa punctatus* (Bloch)

It is also found in the southeastern Balochistan.

65. *Channa striata* (Bloch)

It was recorded from Sindh-Balochistan hills by Day (1880). Its record from Balochistan needs confirmation.

ORDER PERCIFORMES

FAMILY CHANDIDAE

66. *Chanda nama* (Hamilton)

It was also recorded from Sindh-Balochistan hills by Day (1880). Its record from Balochistan needs confirmation.

FAMILY GOBIIDAE

67. *Glossogobius giuris* (Hamilton)

It is widely distributed in the east and southern Balochistan.

ORDER MASTACEMBELIFORMES

FAMILY MASTACEMBELIDAE

68. *Mastacembelus armatus* (Lacepede)

It is widely distributed in the eastern Balochistan from the river Zhob in the north and the river Porali in the south.

Table I: Distribution of higher taxa of freshwater fishes of Balochistan in Gedrosia, Yaghistan and Mehran ichthyogeographical Provinces of Pakistan

	I	II	III
ORDER OSTEOGLOSSIFORMES	-	-	+
I: FAMILY NOTOPTERIDAE	-	-	+
Genus 1. <i>Chitala</i>	-	-	+
2. <i>Notopterus</i>	-	-	+
ORDER CLUPEIFORMES	+	-	+
II: FAMILY CLUPEIDAE	+	-	+
3. <i>Gudusia</i>	-	-	+
ORDER CYPRINIFORMES	+	+	+
III: FAMILY CYPRINIDAE	+	+	+
Subfamily Cultrinae	-	+	+
4. <i>Chela</i>	-	+	+
5. <i>Salmophasia</i>	-	+	+

Subfamily Rasborinae	-	+	+
6. <i>Barilius</i>	-	+	+
7. <i>Devario</i>	-	-	+
8. <i>Rasbora</i>	-	-	+
Subfamily Aspidoparinae	+	-	+
9. <i>Aspidoparia</i>	+	-	+
Subfamily Barbinae	+	+	+
10. <i>Cirrhinus</i>	-	+	+
11. <i>Cyprinion</i>	+	+	+
12. <i>Gibelion</i>	-	-	+
13. <i>Labeo</i>	+	+	+
14. <i>Naziritor</i>	-	+	-
15. <i>Puntius</i>	+	+	+
16. <i>Systomus</i>	-	-	+
17. <i>Tor</i>	+	+	+
Subfamily Garrinae	+	+	+
18. <i>Crossocheilus</i>	+	+	+
19. <i>Garra</i>	+	+	+
Subfamily Schizothoracinae	-	+	+
20. <i>Racoma</i>	-	+	+
21. <i>Schizocypris</i>	-	+	-
22. <i>Schizithorax</i>	-	+	+
IV: FAMILY COBITIDAE	-	+	+
23. <i>Botia</i>	-	+	+
V: FAMILY NEMACHEILIDAE	+	+	+
24. <i>Acanthocobitis</i>	-	+	+
25. <i>Nemacheilus</i>	-	+	+
26. <i>Schistura</i>	+	+	+
27. <i>Triplophysa</i>	+	-	+
ORDER SILURIFORMES	-	+	+
	-	-	+
VI: FAMILY BAGRIDAE	-	-	+
28. <i>Rita</i>	-	-	+
29. <i>Mystus</i>	-	-	+
30. <i>Sperata</i>	-	-	+
VII: FAMILY SILURIDAE	-	-	+
31. <i>Ompok</i>	-	-	+
32. <i>Wallago</i>	-	-	+
VIII: FAMILY AMBLYCIPITIDAE	-	-	+
33. <i>Amblyceps</i>	-	+	+
IX: FAMILY SISORIDAE	-	+	+
34. <i>Glyptothorax</i>	-	-	+
ORDER BELONIFORMES	-	-	+

X: FAMILY BELONIDAE	-	-	+
35. <i>Xenentodon</i>	+	-	+
ORDER CYPRINODONTIFORMES	-	-	+
XI: FAMILY APLOCHEILIDAE	-	-	+
36. <i>Aplocheilus</i>	+	-	+
XII: FAMILY CYPRINODONTIDAE	+	-	+
37. <i>Aphanius</i>	+	-	+
ORDER CHANNIFORMES	+	-	+
XIII: FAMILY CHANNIDAE	+	-	+
38. <i>Channa</i>	-	-	+
ORDER PERCIFORMES	-	-	+
XIV: FAMILY CHANDIDAE	-	-	+
39. <i>Chanda</i>	+	-	+
XV: FAMILY GOBIIDAE	+	-	+
40. <i>Glossogobius</i>	-	+	+
ORDER MASTACEMBELIFORMES	-	+	+
XVI: FAMILY MASTACEMBELIDAE	-	+	+
41. <i>Mastacembelus</i>	-	+	+

I Gedrosia II Yaghistan III Mehran (after Mirza, 1994)

DISCUSSION

The freshwater fish fauna of Balochistan is composed of the South Asiatic, High Asiatic and West Asiatic elements. The Central Brahui Range extending from north to south in the form of Hala Range is the main dividing line. In the east of this line the rivers mostly belong to the Indus drainage system except the river Hab and the river Porali which are coastal rivers falling into the Arabian Sea directly. In the north-eastern part, the snow-carps (subfamily Schizothoracinae) are distributed in the rivers Kunder, Zhob and headwaters of the rivers Nari and Bolan. This area is included in the Yaghistan ichthyogeographical province which extends into NWFP drained by the rivers Gomai, Shahur, Tochi, Kurram and Kabul. The south-eastern Balochistan is a part of Mehran ichthyogeographical province. It lacks Schizothoracine fishes and the Zhobi mahseer, *Naziritor zhobensis* (Mirza), which is distributed in the river Kunder, Zhob, Gomai, Tochi, Kurram and Kabul in the Yaghistan ichthyogeographical province.

The western Balochistan west of the Central Brahui and Hala ranges is included in the Gedrosian ichthyogeographical province which extends into the southeastern Iran also (Coad, 1996). The fish fauna of this province is mainly South Asiatic and West Asiatic. There are no snow-carps. The only central Asiatic representative is *Triplophysa brahui* (Zugmayer), which is endemic to Lora-Pishin River in Balochistan and Afghanistan. In the rivers of the coastal part of Gedrosia there are several species of marine origin, but their systematics and distribution have not been properly studied after

Zugmayer (1913). Thus the fishes of marine origin are not discussed in this paper. Within Gedrosia three ichthyogeographical divisions are possible. In the north-east the river Lora-Pishin has poorest fish fauna. It is composed of the genera *Cyprinion*, *Crossocheilus* and *Garra* (subgenus *Discognathus*) among the *Cyprinidae* and *Triplophysa* and *Schistura* among the *Nemacheilidae*. In the Mashkhel river system the genera *Labeo* (*Bangana*), *Aspidoparia*, *Aphanius* and *Channa* are added but *Triplophysa* is not found. *Triplophysa* is restricted to the Lora-Pishin only in Balochistan. In the coastal areas the genus *Tor* is found in the river Hingol, the genus *Puntius* was recorded by Zugmayer from Pasni (Basol stream). Several genera of marine origin, viz., *Glossogobius*, *Boleophthalmus*, *Periophthalmus*, *Hilsa*, *Acanthopagrus*, *Mugil*, *Liza* etc are added.

The Yaghistan ichthyogeographical province extends into the river Gomal, Shahor, Tochi, Kurram in NWFP with several additional species. The Mehran ichthyogeographical province extends into Indus plain and submontane Indus region where several more fish taxa are added (Table I). The record of *Aplocheilus panchax*, *Channa striata* and *Chanda nama* by Day (1880) from Balochistan needs confirmation.

REFERENCES

- AHMED, M.F., GHALIB, S.A., HASAN, A AND HASNAIN, S.A., 1997. *Studies on the distribution, population dynamics and status of the vertebrate mangrove fauna of Balochistan coast*. Unpublished Report of PARC.
- COAD, B.W., 1996. Freshwater fishes of Iranian and Pakistani Balochistan. *Biologia* (Pakistan), 42: 1-18 (with 1 map)
- DAY, F., 1880. On the fishes of Afghanistan. *Proc. Zool. Soc. London* 1880: 224-232.
- GILS, H.V. AND BAIG, M.S., 1992 (eds). *Environmental profile, Balochistan, Pakistan*. LARUS-ITC (Netherlands) and EU-SSP Pakistan, Lahore.
- GUNTHER, A., 1889. Fishes. In: *Zoology of Afghan Delimitation Commission* (ed. J.E.T. Aitchison) *Trans. Linn. Soc. London* (Series 2, Zool.), 5: 106-109.
- KULLANDER, S.D., FANG, F., DELLING, B. AND AHLANDER, E., 1999. The fishes of Kashmir Valley. In: *River Jhelum, Kashmir Valley: Impact on aquatic environment* (ed. L. Myman) pp. 99-167. Swedmar, Sweden, Goteborg.
- MCCLELLAND, J., 1842. On the freshwater fishes collected by William Griffith. Esq., F. L. S. Madras Medical Service, during his travel under orders of the Government of India from 1835 to 1842. *Calcutta J. nat. Hist.*, 2: 560-589.
- MIRZA, M.R., 1967. *Tor zhobensis* sp. nov., a new mahseer from the river Zhob, West Pakistan. *Pakistan J. scient. Res.*, 19: 54-56.
- MIRZA, M.R., 1972. Freshwater fishes of Balochistan Province, Pakistan. *Biologia* (Pakistan), 18: 153-190.
- MIRZA, M.R., 1994. Geographical distribution of freshwater fishes in Pakistan- a review. *Punjab Univ. J. Zool.*, 9: 93-108.
- MIRZA, M.R., 2003. Checklist of freshwater fishes of Pakistan. *Pakistan J. Zool.*, suppl. No. 3, pp 1-30.

- MIRZA, M.R. AND BHATTI, M.N., 1996. Systematics and biology of golden mahseer of Indus river system. *Biologia* (Pakistan), 42: 31-35.
- MIRZA, M.R., JAVED, M.N. AND TARIQ, M., 1994. A note on the fish fauna of river Zhob, Pakistan. *Pakistan J. Zool.*, 26: 189.
- MIRZA, M.R., KAKAR, J.K. AND KAKAR, A., 1998. Fishes of river Kundar in Kakar Khurasan. *Pakistan J. Zool.*, 30: 158-159.
- MIRZA, M.R. AND NAIK, I.U., 1965. Fishes of Sibi District. *Agric. Pakistan*, 16: 223-233.
- MIRZA, M.R. AND NAIK I.U., 1967. A checklist of fish of Bolan River. *Pakistan J. scient. Res.*, 19:113-119.
- MIRZA, M.R. AND SABHOOL, S., 1990. A note on the freshwater fishes of the river Dasht with the description of *Tariqilabeo* new subgenus (Pisces, Cyprinidae). *Pakistan J. Zool.*, 22: 405-406.
- NAZNEEN, S. AND BEGUM, F., 1993. A study on the food habits of fishes of Hub river, Balochistan. *Philippine J. Sci.*, 122: 179-191.
- NAZNEEN, S., KHAN, M.S.A. AND IQBAL, M.A., 1989. A note on the fishes of Porali River (Balochistan) Pakistan. *Sci. Int. (Lahore)*, 1: 325-326.
- NG, H.H., 2001. *Amblyceps macropterus*, a new species of amblycipitid catfish (Osteichthyes, Amblycipitidae) from Pakistan. *Ichthyol. Explor. Freshwaters*, 12 (3): 201-204.
- SHAHJEHAN, I.A. AND JAN, A., 2001. A contribution to the fishes of river Zhob (Balochistan). *Proc. Pakistan. Congr. Zool.*, 21: 61-68.
- SIDDIQI, S.A., 1992. River Bolan. *Agric. Pakistan*, 13: 306-312.
- ZUGMAYER, E., 1912. Eight new fishes from Balochistan. *Ann. Mag. nat. Hist.*, 10: 595-599.
- ZUGMAYER, E., 1913. Fishes of Balochistan. *Abh. Bayer. Akad. Wiss. Berl. (math-nat. Klasse)*, 26: 1-35 (in German).

(Received: July, 2004)