Indian J. Fish., 61(4) : 118-123, 2014

Note

Redescriptions of *Chelidoperca investigatoris* (Alcock, 1890) and *Chelidoperca occipitalis* Kotthaus, 1973 (Perciformes: Serranidae) from the south-west coast of India

K. K. BINEESH[1], K. V. AKHILESH[2], E. M. ABDUSSAMAD[2], N. G. K. PILLAI[2], RALF THIEL[3] J. K. JENA[4] AND A. GOPALAKRISHNAN[2]

[1]*National Bureau of Fish Genetic Resources (NBFGR), Cochin Unit, CMFRI Campus, P. B.No.1603, Ernakulam North, P.O., Kochi - 682 018, Kerala, India*
[2]*Central Marine Fisheries Research Institute, P.B. No. 1603, Ernakulam North, P.O., Kochi - 682 018, Kerala, India*
[3]*Biocenter Grindel und Zoological Museum, University of Hamburg, Martin-Luther-King-Platz 3, 20146 Hamburg, Germany*
[4]*National Bureau of Fish Genetic Resources, Canal Ring Road, P. O. Dilkusha, Lucknow - 226 002 Uttar Pradesh, India*
e-mail: kkbineesh@gmail.com

ABSTRACT

Chelidoperca investigatoris (Alcock, 1890) was described based on two specimens collected off the Madras coast (Tamil Nadu), Bay of Bengal and *Chelidoperca occipitalis* Kotthaus, 1973 was described from a single specimen collected off the Socotra Islands, Arabian Sea. In 2009-2010, many additional specimens of these two species were collected from off Kollam (Kerala), south-west coast of India. For *C. occipitalis* report from south-western India forms a considerable extension of its known distribution range. *Chelidoperca investigatoris* and *C. occipitalis* are redescribed based on these new specimens.

Keywords: *Chelidoperca investigatoris, Chelidoperca occipitalis*, India, Perchlets, Redescription

The serranid fish genus *Chelidoperca*, proposed by Boulenger (1895) for *Centropristis hirundinaceus* Valenciennes, 1831, comprises seven species; *Chelidoperca hirundinacea* (Valenciennes, 1831), *C. pleurospilus* (Günther, 1880), *C. lecromi* Fourmanoir, 1982, *C. investigatoris* (Alcock, 1890), *C. margaritifera* Weber, 1913, *C. occipitalis* Kotthaus, 1973 and *C. maculicauda* Bineesh and Akhilesh, 2013 (Bineesh *et al.,* 2013; Eschmeyer and Fong, 2014).

Members of the *Chelidoperca* genus are usually found on continental shelf and slope muddy bottoms in the Indo-West Pacific (Nelson, 2006; Bineesh *et al.,* 2013). Three species of *Chelidoperca*, namely *C. investigatoris, C. occipitalis* and *C. maculicauda* are known from the Arabian Sea (Baranes and Golani, 1993; Manilo and Bogorodsky, 2003; Jayaprakash *et al.,* 2006; Sajeevan *et al.,* 2009; Bineesh *et al.,* 2013). However, *C. investigatoris* and *C. maculicauda* are the only valid species of the genus known from the Indian Exclusive Economic Zone (Bineesh *et al.,* 2013). This study provides new report of *Chelidoperca occipitalis* from southern India and provides a redescription of *Chelidoperca occipitalis* and *C. investigatoris* based on recently collected materials from Arabian Sea off south-west coast of India.

During weekly observations of fish landings along the south-west coast of India, specimens of *C. investigatoris* and *C. occipitalis* were collected from bycatch landings of commercial deep sea shrimp trawls operated in the Arabian Sea, off Kollam during 2009-2010. These were landed at Sakthikulangara Fisheries Harbour, Kollam (Quilon), Kerala. Species were identified following Alcock (1890), Kotthaus (1973), Senou (2002) and Park *et al*. (2007). Morphometric measurements of formalin (5%) preserved specimens were taken following Hubbs and Lagler (1964). The specimens are deposited in the fish collection of the Designated National Repository (DNR) at Central Marine Fisheries Research Institute (CMFRI), Cochin, Kerala, India. Institutional abbreviations are:

ZSI – Zoological Survey of India, Kolkata, India; DNR – Designated National Repository, CMFRI, Cochin, Kerala, India; ZMH – Zoological Museum of the University of Hamburg, Germany.

Family Serranidae
Chelidoperca Boulenger, 1895
Chelidoperca investigatoris (Alcock, 1890)
Indian perchlet
(Fig. 1-3; Tables 1, 3)

Chelidoperca investigatoris (Alcock, 1890) (Syntypes: ZSI; off Chennai). Jayaprakash *et al.,* 2006; (list, India). Sajeevan *et al.,* 2009; (list, India). Bineesh *et al.,* 2013.

Diagnosis: A species of *Chelidoperca* with dorsal-fin rays X, 10, fourth spine largest (3.14-3.37 in HL) longer than 3rd spine; body depth 26.23-27.82% SL; head length 41.95-48.71% SL; orbit length 8.85-11.06 in SL; 2.5 scales above lateral line to dorsal-fin origin; serrae on margin of preopercle 25-37; head and body bright pinkish in colour. A broad bright yellow band passes from the tip of the snout through the eye to the caudal fin (very clear in the snout region). Narrow pale red borderline on anal fin.

Description: (Meristic and morphometric data are given in Table 1 and 3)

Dorsal fin rays X, 10; pectoral fin rays 15; pelvic fin rays I, 5; anal fin rays III, 6; caudal fin rays 7; branchiostegal rays 7; lateral-line scales 42; gillrakers 3+4 - 8+4; vertebrae 23.

Body moderately elongate, cylindrical; depth 3.69-3.81 in standard length (SL), 1.55-1.73 in head length (HL); head moderately compressed, head length 41.95-48.71% SL, 2.05-2.38 in SL; snout short, pointed, snout length 4.55-5.44 in HL; orbit moderately large, 9.05-11.32 in SL, larger than inter-orbital width and snout length; interorbital space flat, scaly, scales reaching up to the orbit; inter-orbital 10.54-15.79 in HL; opercle with 2 flattened spines, lower one prominent; preopercle rounded, finely serrated with 25-37 serrae; caudal peduncle depth 10.77-11.83% SL.

Fig. 1. *Chelidoperca investigatoris*. (A). ZSI 12821, 103 mm SL, female. (B) ZSI 12820, 107 mm SL, female

Fig. 2. *Chelidoperca investigatoris* GB.31.139.16.2, 125 mm SL


Fig. 3. *Chelidoperca investigatoris*. Dorsal view. GB.31.139.16.2, 12.5 mm SL

Mouth large, terminal, oblique, lower jaw projecting in front of upper jaw; jaws strong, maxilla reaches the vertical through the posterior border of the orbit, teeth in villiform bands in pre-maxilla and palatines and in a small patch on the vomer; small canines in the mandible and at the maxillary symphysis; upper jaw length in 2.26-2.52 in HL; tongue long slender and spathulate.

Scales ctenoid; maxilla, snout devoid of scales; maxilla truncate posteriorly, with rounded corners; 2.5 scale rows between 1st dorsal fin spine and lateral line. Dorsal fin continuous, deeply notched, originating behind level of opercle. First dorsal spine small, 7.67-10.16 in HL; 4th dorsal spine largest, 2.92-3.02 in HL; dorsal rays branched from half of their length, additional branches at tips; pre-dorsal length 37.40-40.27% SL. Pelvic fins inserted beneath, origin in front of pectoral fins, tips not reaching to anal fin origin, pelvic fin length 1.91-2.30 in HL, 18.21-25.21% SL. Pectoral fins long, reaching to level of anal fin origin, 22.37-27.83% SL. Anal fin origin below level of first dorsal fin soft ray; preanal fin length longer than HL, 64.40-70.12% SL; anal rays branched like

Table 1. Morphometric data of *Chelidoperca investigatoris.* (Measurements expressed in % SL)

Measurements (% SL)	Syntype ZSI 12820	Syntype ZSI 12821	NBFGR CHN 3015	Range (n=12)	Standard deviation
Total length (mm)			178	-	-
Standard length (mm)	107.5	103.4	139.0	-	-
Body depth	27.2	27.8	27.1	26.2-27.8	0.5
Head length	47.7	48.7	42.5	41.9-48.7	2.7
Post orbital length	27.6	28.5	25.4	24.9-28.5	1.3
Snout length	9.9	10.7	8.3	7.7-10.7	1.0
Eye diameter	10.4	11.1	8.8	8.9-11.1	0.9
Upper jaw length	19.7	19.3	18.3	18.3-19.7	0.6
Interorbital width	3.1	3.1	4.0	3.4-4.1	0.4
Predorsal length	38.6	39.9	37.4	37.4-40.3	1.1
Prepectoral length	43.3	42.6	41.5	39.4-43.3	1.3
Prepelvic length	39.9	37.2	36.1	34.1-39.9	1.8
Preanal length	70.1	66.5	66.2	64.4-70.1	1.8
Pectoral fin length	27.3	27.8	24.3	22.4-27.8	1.9
Pelvic fin length	25.1	25.2	20.8	18.2-25.2	2.5
Length of first anal fin ray	-	-	12.3	11.6- 13.1	0.6
Caudal fin length	-	-	28.3	25.2-28.4	1.4
Caudal peduncle depth	10.8	11.0	11.7	10.8-11.8	0.5
Anal fin length	-	-	29.9	27.1-30.1	1.2
Anal fin base length	14.0	14.8	16.6	14.0-16.8	1.1
Dorsal fin length	-	-	63.2	58.5-63.3	2.3
Dorsal fin base length	42.9	45. 5	49.9	47.9-49.9	2.5
Caudal peduncle length	22.8	21.3	19.9	19.9-23.9	1.5
First dorsal spine length	3.49*	2.8*	4.8	4.5-5.9	1.0
Second dorsal spine length	6.58*	6.5*	8.6	8.2-9.7	1.2
Third dorsal spine length	9.7*	9.2*	10.5	10.5-12.9	1.3
Fourth dorsal spine length	-	-	12.6	12.6-14.4	0.8
Last dorsal spine length	-	-	9.9	9.0-9.9	0.4

**Damaged/broken*

dorsal rays. Caudal fin emarginate, with upper lobe longer than lower lobe.

Colouration: Head and body pinkish in colour, belly and throat white. A broad bright yellow band passes from the tip of the snout through the eye to the caudal fin. Bright yellow markings on the cheeks, opercles, dorsal, ventral and anal fins. Narrow pale red borderline on anal fin. Colour in formalin: pale with four incomplete cross bands of grey.

Distribution: Known from deeper waters off Chennai, Tuticorin (Bay of Bengal), Mangalore, Gujarat, Kollam and Kerala Coast (Arabian Sea) at depths ranging from 180-340 m. The specimens reported herein were collected off Kollam at 220-340 m depths.

Remark: Chelidoperca investigatoris is common bycatch of deep sea shrimp trawl fishery off Kollam (Kerala coast) where it is sold in the domestic market.

***Chelidoperca occipitalis* Kotthaus, 1973**
Arabian perchlet
(Fig. 4, 5, 6 Tables 2, 3)

Chelidoperca occipitalis Kotthaus, 1973 (Holotype: ZMH 5136; Socotra Islands, Arabian Sea). Manilo and Bogorodsky, 2003 (list, Arabian Sea).

Diagnosis: Dorsal fin rays X, 10, fourth spine largest (2.4-2.9 in HL) slightly longer than 3rd spine, all soft rays branched; anal fin rays III, 6; pectoral fin rays 15; lateral-line scales 44. gill rakers 3+5-8+4.

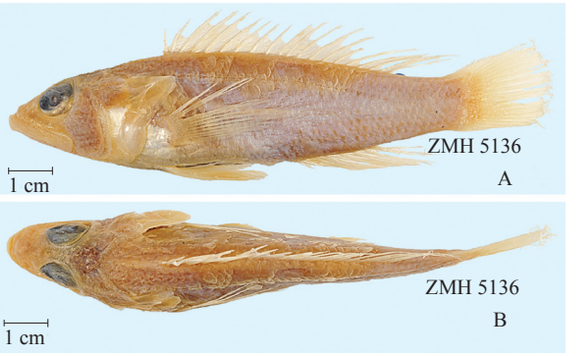

Fig. 4. Holotype of *Chelidoperca occipitalis*, ZMH 5136, 114 mm SL, collected from south-west of Socotra Islands, Arabian Sea. A - ventral view, B - dorsal view

Fig. 5. *Chelidoperca occipitalis* GB.31.139.16.1, 12.5 mm SL from Kollam, south-west coast of India

Fig. 6. *Chelidoperca occipitalis* GB.31.139.16.1, dorsal view of head

Table 2. Morphometric data of *Chelidoperca occipitalis*. (Measurements expressed in % SL)

Measurements (% SL)	Holotype ZMH 5136	GB 31.139.16.1	Range (n=14)	Standard deviation
Total length (mm)	139.1	160	135-160	-
Standard length (mm)	114	128	110-128	-
Body depth	24.8	25.4	23.5-25.5	0.7
Head length	41.8	43.6	41.4-44.7	1
Post orbital length	22.4	24.2	22.4-24.9	0.6
Snout length	9.9	10.9	8.9-10.9	0.7
Eye diameter	10.6	10.6	9.1-10.6	0.4
Upper jaw length	17.9	18.5	17.2-18.7	0.5
Interorbital width	3.4	4.2	2.9-4.3	0.4
Predorsal length	38.2	38.3	37.2-38.8	0.5
Prepectoral length	40.5	41.1	38.6-41.1	0.9
Prepelvic length	36.4	36.4	34.4-40.2	2.1
Preanal length	64.1	63.6	61.4-64.9	1.3
Pectoral fin length	24.5	25.4	21.6-25.7	1.4
Pelvic fin length	23.5	23.9	22.3-23.9	0.7
Length of first anal fin ray	12.5	11.9	11.6-13.6	0.7
Caudal fin length	22.3	26.7	21.5-26.7	1.9
Caudal peduncle depth	11.2	12	10.9-12.1	0.4
Anal fin length	30.5	31.4	29.8-32.9	1
Anal fin base length	17.7	17.5	15.9-18.2	0.8
Dorsal fin base length	49.5	50.9	46.3-52.4	2
Caudal peduncle length	19.1	20.8	17.1-21.5	1.6
First dorsal spine length	5.3	5	3.6-5.9	0.9
Second dorsal spine length	9.1	9	7.1-9.9	1
Third dorsal spine length	13	12.4	11.9-14.3	0.9
Fourth dorsal fin spine length	14.3	14.8	12.7-15.9	1.2
Last spine length	10.2	9.4	9.4-10.2	0.4

Table 3. Frequency distributions in two species of *Chelidoperca* for total numbers of gillrakers on first gill arch, numbers of tubed lateral line scales

Total number of gill rakers on first gill arch	14	16	17		18	19	20	21
Chelidoperca investigatoris					1	5	6	1
Chelidoperca occipitalis						7	5	3
Total numbers of tubed lateral-line scales		41	42	43	44			
Chelidoperca investigatoris			5	4				
Chelidoperca occipitalis				7	2			

Body depth 3.93-4.15 in SL; head length 2.24-2.36 in SL; orbit length 9.40-10.97 in SL; 3 scales above lateral line to dorsal origin; circum-peduncle scales 14. Serrae on margin of preopercle 28-38. Body pinkish in colour with a dark band along body, to caudal. Yellow spots on dorsal, caudal and anal fins.

Description: Selected meristic and morphometric data are given in Table 2 and 3. Data of the holotype of *Chelidoperca occipitalis* were taken from the specimen of the original description.

Dorsal fin rays X, 10, single, deeply notched, fourth spine largest (2.62-3.54 in HL), slightly longer

than 3rd spine; anal fin rays III, 6; pectoral fin rays 15; lateral line scales 44; gill rakers 3+5-8+4; vertebrae 23; branchiostegal rays 6.

Body moderately elongate, cylindrical; Body depth 3.93-4.15 in SL, depth 1.66-1.82 in HL; head moderately compressed, head length 2.24-2.36 in SL; snout short, pointed, snout length 4.00-4.72 in HL; orbit moderately large, larger than inter-orbital width and snout length, orbit length 9.40-10.97 in SL; inter orbital space flat, scaly; inter orbital 10.31-14.59 in HL. Opercle with two flattened spines; lower one prominent. Preopercle rounded, finely serrated (28-39).

Mouth large, terminal, oblique, lower jaw projecting in front of upper jaw; upper lip not swollen at symphysis; maxilla not reaching rear edge of orbit in vertical; upper jaw length 2.33-2.46 in HL; jaws with band of minute slender canine teeth, the band widening anteriorly, a gap in the middle of symphysis, vomerine teeth absent. Tongue long slender and tip knob like.

Scales ctenoid; maxilla, snout devoid of scales; maxilla truncate posteriorly, with rounded corners. No scales in front of orbit. Three scale rows between first dorsal fin spine and lateral line; single dorsal fin, deeply notched, dorsal fin originating behind opercle in vertical. First dorsal spine small, 7.13-12.35 in HL; fourth dorsal spine largest (2.62-3.54 in HL); posterior dorsal rays longest. Dorsal rays branched from half of their length, additional branches at tips. Pelvic fins inserted beneath in front of pectoral fins, not reaching to anal origin, 1.83-1.90 in HL. Pectoral fins long, reaching anal fin origin in vertical, 1.65-1.93 in HL. Anal fin origin below dorsal ray origin in vertical. Pre-anal fin length longer than HL %SL. Anal rays branched like dorsal rays. Caudal peduncle depth 10.9-11.4 % SL, 3.60-3.93 in HL. Circum-peduncle scales 13-14. Caudal fin truncate; upper rays elongated in few specimens.

Colouration: Body pinkish-orange in colour with a prominent dark stripe running from opercular spine to base of caudal fin. Ventral portion of trunk pale with 8-9 white bands on side. Yellow spots on dorsal, caudal and anal fins, those on dorsal, caudal rays prominent. Colour in formalin pale with prominent black stripe along middle of trunk and caudal fin with pale spots.

Distribution: This species is widely distributed in the Indian Ocean from Socotra Islands, Pakistan (M. Khan pers. comm.) and Veraval (M. Srinath pers. comm.) up to Kerala coast of southern India. The specimens reported herein were collected off Kollam at 180-320 m depth.

Remarks: Chelidoperca occipitalis is common in collections made off Kollam and is frequently caught along with *Plesionika* spp. in the bycatch of deep sea shrimp trawl fishery. It is sold in domestic markets.

Chelidoperca investigatoris was described by Alcock (1890) based on the collection of RIMS *Investigator* from Madras coast (Station 96, depth 98-103 fathoms, pages 198, 200), but in subsequent publication of Alcock (1899) (pages 22-24) the type area for same materials are given as off Ganjam coast (Orissa), Bay of Bengal, which was followed in many publications including Bineesh *et al.,* 2013. Herein we correct that Madras is the type locality, as landing of *Chelidoperca investigatoris* in deep sea trawls is confirmed. *Chelidoperca investigatoris* is the only known species of the genus from Indian waters, but after Alcock (1890), the report of *C. investigatoris* was limited to listing in deep sea fishery expeditions along the south-west coast of India (Jayaprakash *et al.,* 2006; Sajeevan *et al.,* 2009) but no additional details, figures, descriptions were provided, though the genera had taxonomic confusions. *Chelidoperca investigatoris* differs from other *Chelidoperca* species by its bright pink coloured head and body with broad bright yellow band. The interorbital space of this species is covered with a scaled band (Fig. 3). The overlapping colour pattern (dark blotches on the body) of *C. occipitalis* closely resembles *C. pleurospilus* (Günther, 1880), but on a closer examination shows variation in colour from description by Park *et al.* (2007). *Chelidoperca occipitalis* have interorbital 10.3-14.6 in HL, *vs* <10.95 in *C. pleurospilus* (Akazaki, 1972). Earlier and original descriptions of both *C. occipitalis* and *C. investigatoris* were with limited character descriptions, which were not enough to diagnose to species level and no colour plates were available. This article provides detailed morphometric data and colour plates, which enables easy identification of species in commercial landings.

Other material examined in this study

Chelidoperca investigatoris: Syntype, ZSI 12820, 107.5 mm SL, syntype, ZSI 12821, 103.4 mm SL, off Madras coast, Tamil Nadu, India, 180-187 m depth, R.I.M.S. *Investigator*. NBFGR CHN 3012-3024, 13 specimens, 127.5-177.9 mm TL, off Kollam, Kerala coast, India, south-eastern Arabian Sea (09°05’ N, 75°52’E), 180-280 m depth, collected by K. K. Bineesh and K. V. Akhilesh, 08 February 2009.

Chelidoperca occipitalis: Holotype, ZMH 5136, 114 mm SL, Off Socotra Islands, Arabian Sea, 190-290 m depth. CMFRI GB 31.139.16.1.1-3, 3

specimens, 135-153 mm TL, NBFGR CHN 3001- 3011, 11 specimens, 135-163 mm TL, off Kollam, India, Kerala coast, south-eastern Arabian Sea (09°20' N, 75°51' E), 180-320 m depth, collected by K. K. Bineesh and K.V. Akhilesh, 22 April 2009.

Acknowledgements

Authors are grateful to the Director, Central Marine Fisheries Research Institute (CMFRI), Kochi for the support. K. A. Sajeela, National Bureau of Fish Genetic Resources (NBFGR), Kochi Unit is acknowledged for support in Barcoding works. S. S. Mishra (Zoological Survey India, Kolkata) is acknowledged for the support during museum visit. The financial assistance received from the MoES/CMLRE, Govt. of India is thankfully acknowledged.

References

Akazaki, M. 1972. A critical study of the serranid fishes of the genus *Chelidoperca* found in Japan. *Jpn. J. Ichthyol*., 19 (4): 174-282.

Alcock, A. 1899. *A descriptive catalogue of the Indian deep sea fishes in the Indian Museum, being a revised account of the deep sea fishes collected by the Royal Indian Marine Survey Ship Investigator*. The Indian Museum, Calcutta, 221 pp.

Alcock, A. W. 1890. Natural history notes from H. M. Indian marine survey steamer '*Investigator*', Commander R. F. Hoskyn, R. N., commanding. No. 16. On the bathybial fishes collected in the Bay of Bengal during the season 1889-1890. *Annals and Magazine of Natural History*, 6 (33): 197-222.

Bineesh, K. K., Akhilesh, K. V., Abdussamad, E. M. and Pillai, N. G. K. 2013. *Chelidoperca maculicauda*, a new species of perchlet (Teleostei: Serranidae) from the Arabian Sea. *Aqua Int. J. Ichthyol*., 19 (2): 71-78.

Baranes, A. and Golani, D. 1993. An annotated list of the deep sea fishes collected in the northern Red Sea, Gulf of Aqaba. *Isr. J. Zool*., 39: 299-336.

Eschmeyer, W. N. and Fong, J. D. 2014. *Species of fishes by family/subfamily*. Online version dated 18/02.2011http://research.calacademy.org/research/ichthyology/catalog.

Hubbs, C. L. and Lagler, K. F. 1964. *Fishes of the Great Lakes region.* The University of Michigan Press, Ann Arbor, 213 pp.

Jayaprakash, A. A., Kurup, B. M., Sreedhar, U., Venu, S., Divya, T., Hashim, M., Anish, V. P., Paul, T. and Sudhakar, S. 2006. Distribution, diversity, length-weight relationship and recruitment pattern of deep sea finfishes and shellfishes in the shelf-break area off south-west region, Indian EEZ. *J. Mar. Biol. Ass. India*, 48 (1): 56-67.

Kotthaus, A. 1973. Fische des Indischen Ozeans. Ergebnisse der ichthyologischen Untersuchungen während der Expedition des Forschungsschiffes "Meteor" in den indischen Ozean, Oktober 1964 bis Mai 1965. A. Systematischer Teil, X Percomorphi (3). *Meteor Forschungsergebnisse*, Reihe D, Biologie No. 16: 17-32.

Manilo, L. G. and Bogorodsky, S. V. 2003. Taxonomic composition, diversity and distribution of coastal fishes of the Arabian Sea. *J. Ichthyol*., 43 (1): 75-149.

Nelson, J. S. 2006. *Fishes of the world,* 4th edn. John Wiley & Sons, Hoboken, 601 pp.

Park, J. H., Kim, J. K., Choi, J. H., Chang, D. S. and Park, J. H. 2007. First record of two perciform fishes, *Chelidoperca pleurospilus* (Serranidae) and *Parapercis muronis* (Pinguipedidae) from Korea. *Korean J. Ichthyol.*, 19(3): 246-251.

Sajeevan, M. K., Somvanshi, V. S. and Rajasekharan Nair, J. 2009. Deep sea teleostean species diversity off the south-west coast of India (7º N-10º N lat.). *Asian Fish. Sci*., 22: 617-629.

Senou, H. 2002. Serranidae. In: Nakabo, T. (Ed.), *Fishes of Japan with pictorial keys to the species*. English edn. Tokai University Press, Tokyo, p. 690-731.

Date of Receipt : 06.12.2013
Date of Acceptance : 26.06.2014