ALEXANDRE F. BANNIKOV* - ROBERTO ZORZIN**

(*Borisyak Paleontological Institute of the Russian Academy of Sciences, Moscow)
(**Museo Civico di Storia Naturale, Verona)

A NEW PRIACANTHID-LIKE PERCOID FISH (PERCIFORMES) FROM THE EOCENE OF BOLCA, ITALY

ABSTRACT

The new genus and species of perciform fish *Pavarottia lonardonii* gen. et sp. nov. is described from the Eocene locality Monte Postale of Bolca in northern Italy based on a single specimen; it is regarded as a percoid of uncertain, but perhaps priacanthid, relationships. Even though it has overall similarity with the Priacanthidae, the new genus lacks an important priacanthid autapomorphy, i.e., the number of vertebrae reduced to 23. Moreover, the vertebral count of *Pavarottia lonardonii* gen. et sp. nov. is somewhat increased from the basal percoid number of 24-25.

Key words: Perciformes, Percoidei, new taxa, Eocene, northern Italy, Bolca locality.

RIASSUNTO

Un nuovo genere e una nuova specie di perciforme, *Pavarottia lonardonii* gen. e sp nov., viene descritto, sulla base di un esemplare proveniente dalla località eocenica del Monte Postale di Bolca, Italia settentrionale; è considerato come un percoide incerto, ma probabilmente con parentela con i priacantidi. Avendo complessivamente similitudine con Priacanthidae, il nuovo genere è privo dell'importante autopomorfia dei priacantidi, i.e. il numero delle vertebre è ridotto a 23. Inoltre, il conteggio delle vertebre di *Pavarottia lonardonii* gen. e sp nov. è maggiore rispetto alle 24-25 fondamentali per i percoidi.

Parole chiave: Perciformes, Percoidei, nuovo taxa, Eocene, Italia settentrionale, Bolca.

INTRODUCTION

The Eocene marine fishes from the Monte Bolca localities (northern Italy) have been known from the mid-sixteenth century (Sorbini, 1981). The first comprehensive paleoichthyological monograph on Monte Bolca fishes, the "*Ittiolitologia Veronese*", was produced by the Abbot G.S. Volta in 1796. Somewhat later Agassiz (1833-1844) published his pioneering treatise on comparative ichthyology, which was based largely on the material collected from Monte Bolca. Since that time, many publications by various authors have been devoted to the Monte Bolca fish fauna. The list of the Monte Bolca fishes published by Blot (1980) includes 72 families, 117 genera (plus a number of announced but undescribed genera) and 208 species (including still undescribed ones) of teleost fishes. Since

that time the families Ogcocephalidae, Serranidae, Percidae, Terapontidae, Haemulidae, Mullidae, Chaetodontidae, Enoplosidae, Trachinidae and Blenniidae, as well as the extant genera *Caranx*, *Apogon*, *Antigonia* and *Auxis*, have been excluded from the Monte Bolca fish fauna. The validity of the genus *Heptadiodon* Bronn, 1855 was restored (Bannikov and Tyler, 1997). Many species names of Bolca taxa have been regarded as synonymized. In the past 25 years the list of Monte Bolca fishes has been extended to include representatives of the families Gerreidae, Apolectidae, Lutjanidae, Euzaphlegidae, Palaeorhynchidae, Centrolophidae, and by the new fossil families Rhamphognathidae, Mesogasteridae, Quasimullidae, Eocottidae, Tortonesidae, Sorbinipercidae, Zorzinichthyidae, Acanthonemidae, Massalongiidae, and by a number of new genera. According to the most recent data of the first listed author, the Teleostei known from the Monte Bolca fish fauna belong to 18 orders, 85 families, about 170 genera and approximately 200 species (see Bannikov, 2010). Nevertheless, each new season of excavations in the Pesciara and Monte Postale sites yields discoveries of new fish taxa.

The recently renewed emphasis on excavations at the Monte Postale site (a few hundred meters across a ravine from the classic Pesciara site) of the Monte Bolca locality, conducted by the Museo Civico di Storia Naturale di Verona, has already brought forth many scientifically exciting new materials of fossil coral-reef and lagoonal associated fishes whose descriptions are just now beginning to be published. Among these is the skeleton of a percoid fish found in 2004. This fish has strong superficial resemblance with the family Priacanthidae already known from the Monte Bolca locality by *Pristigenys substriatus* (Blainville, 1818). Study of the newly discovered specimen shows that it cannot be attributed to the priacanthids because it lacks an important priacanthid autapomorphy, i.e., the number of vertebrae reduced to 23 (Starnes, 1988). The specimen under consideration represents the holotype of a new genus and species of the Percoidei *incertae sedis*, perhaps related to the Priacanthidae. Because *Pavarottia lonardonii* gen. et sp. nov. is represented by a single relatively poorly preserved specimen, we believe that it is premature at present to either establish a new family for it or modify the diagnoses of any of the percoid families to accommodate the new taxon. We prefer to retain *Pavarottia lonardonii* gen. et sp. nov. *incertae sedis* within the generalized Percoidei.

METHODS

Some details of the specimen examined were best seen when the specimen was moistened with alcohol during microscopic examination.

Interneural and interhaemal spaces are numbered based on the vertebra whose neural or haemal spine forms the anterior border of the space, with the first space being between the first and second neural or haemal spines (following Baldwin and Johnson, 1993; Bannikov and Tyler, 1995; Tyler and Bannikov, 1997; etc.).

Abbreviations are as follows: *Institutional*: MCSNV – Museo Civico di Storia Naturale di Verona; *Anatomical*: H – hypural; HL – head length; Ph – parhypural; PU – preural vertebra; SL – standard length; St – stegural; U – ural vertebra.

<div align="center">

SYSTEMATIC DESCRIPTION

Order Perciformes
Suborder Percoidei
Family incertae sedis
Genus *Pavarottia* gen. nov.

</div>

DIAGNOSIS. Body relatively deep, head rather large. Head length less than body depth. Snout relatively short. Eye large, orbit diameter exceeds both snout length and postorbital distance. Mouth relatively wide, terminal. Ascending premaxillary process short. Jaw teeth small, conical. Lower jaw articulation at a level behind the middle of orbit. Opercular region narrow. Vertebrae 28 (11 + 17); four posterior abdominal vertebrae with strong parapophyses. Pleural ribs long. Hypurals unfused. Two supraneurals. Dorsal fin single, relatively long-based; soft part being as equally long as spinous part. Dorsal fin with 11 strong spines (5th longest) and about 16 soft rays. Anal fin with three spines and about 12 soft rays. Anal fin with moderate base length. Pectoral fins attached relatively low. Pelvic fins relatively long, situated below the pectorals. Caudal fin slightly concave, with 17 principal rays. Scales moderately large, evidently cycloid.

TYPE SPECIES. *Pavarottia lonardonii* sp. nov., by monotypy and designation herein.

ETYMOLOGY. In honour of the outstanding Italian tenor Luciano Pavarotti; gender feminine.

COMPOSITION. Type species only.

<div align="center">

Pavarottia lonardonii sp. nov.
Figures 1-3

</div>

DIAGNOSIS. As for the genus.

HOLOTYPE. MCSNV IGVR71259, single plate, ca. 48.5 mm SL; upper part of the Lower Eocene or lower part of the Middle Eocene (Medizza, 1975; Papazzoni and Trevisani, 2006), zone *Discoaster sublodoensis*; Monte Bolca locality, Monte Postale site.

REFERRED SPECIMENS. None.

ETYMOLOGY. In honour of Diego Lonardoni, Director of the Ente Parco Naturale Regionale della Lessinia.

DESCRIPTION. The body is relatively deep, with a short caudal peduncle. The caudal peduncle depth is about 0.24 of the body depth. The head is relatively large; its length is about 0.76 of the body depth. The head length is contained 2.6 times in SL. The maximum body depth is greater than one-half of SL. The dorsal and ventral profiles of the body are either about equally convex or the dorsal profile slightly more convex.
- Head. The length of the head is less than its depth. The orbit is large; the diameter of the
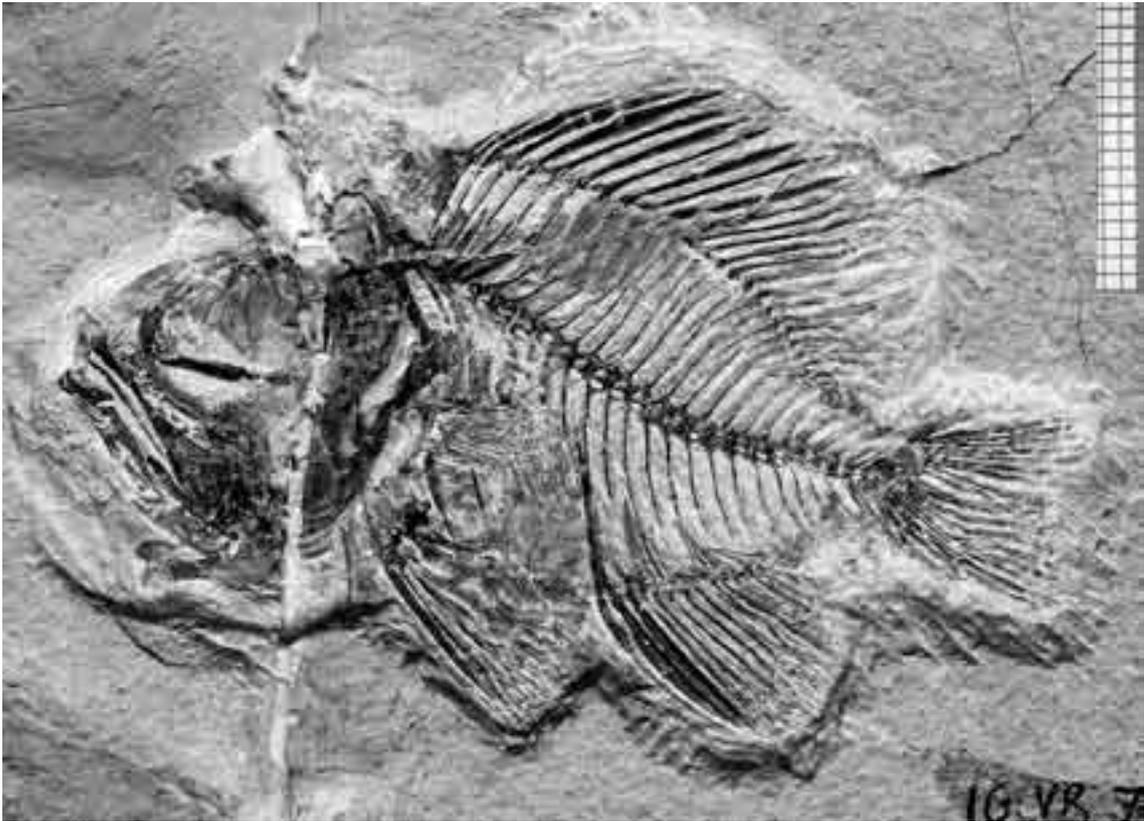
Fig. 1 – *Pavarottia lonardonii* gen. et sp. nov., holotype MCSNV IG VR 71259, ca. 48.5 mm SL; uppermost Lower or lowermost Middle Eocene, Monte Bolca locality in northern Italy, Monte Postale. Scale division: 1 mm.

orbit exceeds both the snout length and the postorbital distance and is contained 2.3 times in HL. The mouth is wide, oblique and terminal; the lower jaw articulation is situated at a level behind the middle of the orbit. The neurocranium is very poorly preserved; conditions of the supraoccipital crest are unknown. The ethmoid region is evidently short. The parasphenoid is exposed in the lowermost portion of the orbit as a relatively slender, almost straight shaft. The parasphenoid has a flattened dorsal surface and no prominent ventral flange. None of the infraorbital bones are preserved except for faint traces of the lachrymal, which bears the lateral line sensory canal pores. The poorly preserved premaxilla has a very short ascending process. The premaxillary teeth are very poorly preserved in the holotype, but these are definitely very small and conical. The maxilla is long and almost straight; it is slender anteriorly and in the middle and widened at the distal end. The supramaxilla seems to be missing. The lower jaw is long; its length is about 72% of HL. The dentary occupies most of the lower jaw; it is shallow near its symphysis. The dentary is incised posteriorly for the articulation to the angulo-articular. There are indications of the lateral line sensory canal in both the lower portion of the dentary and the angulo-articular. The retroarticular process of the mandible is deeper than its symphysis. The lower jaw teeth are very small and conical. Neither the suspensorium nor the opercular bones are well-enough preserved to be described. The axis of the hyomandibula seems to be vertical. The quadrate is relatively small and triangular. The opercular region is
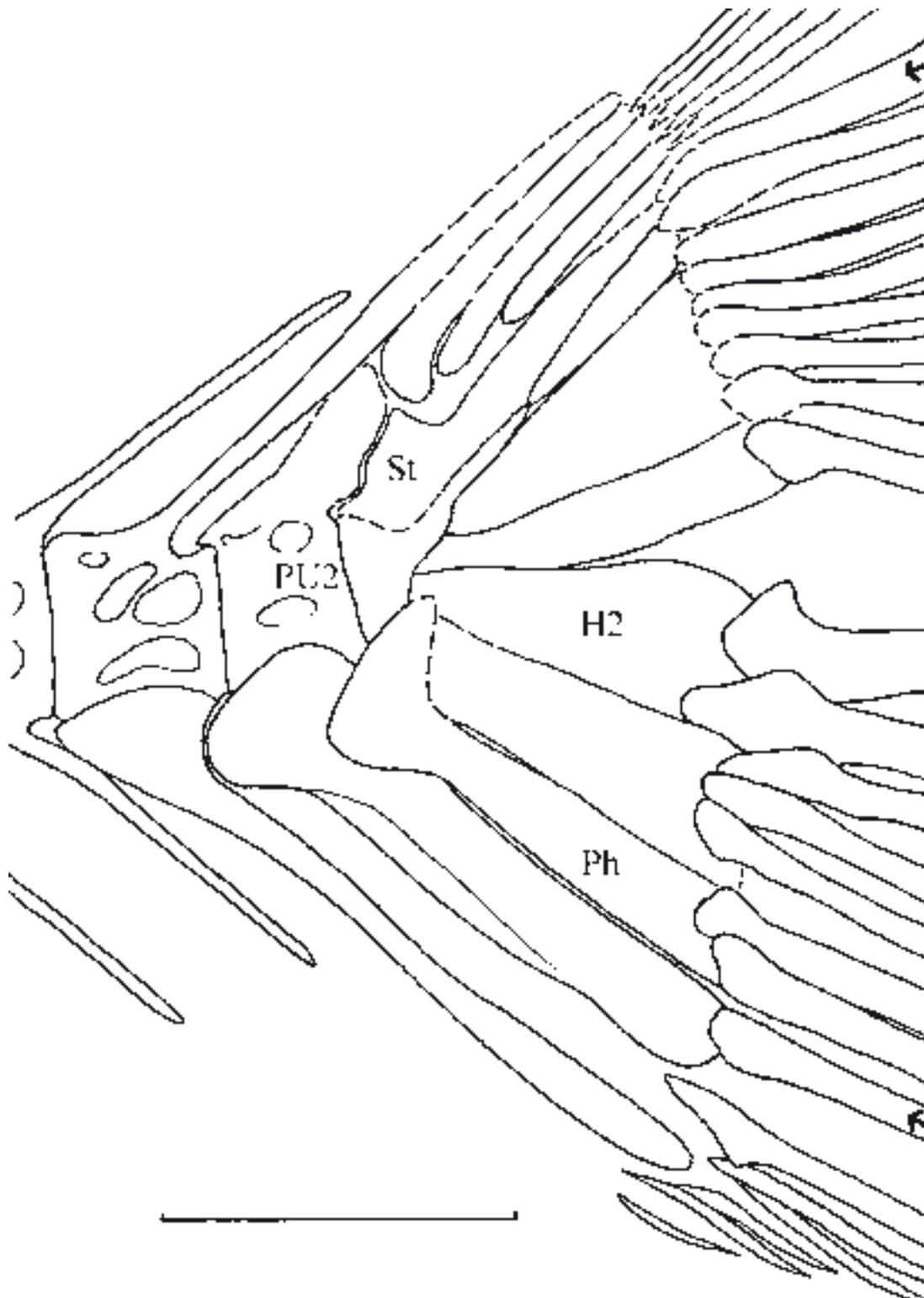
Fig. 2 – *Pavarottia lonardonii* gen. et sp. nov., reconstruction of the caudal skeleton based on the holotype MC-SNV IG VR 71259; arrows mark the outermost principal caudal-fin rays. Scale bar = 2 mm.

Fig. 3 – *Pavarottia lonardonii* gen. et sp. nov., reconstruction of the skeleton based on the holotype; scales omitted.

narrow. The hyoid bar is relatively small. The ceratohyal is relatively wide at its anterior end and lacks a "beryciform" foramen. The hypohyals are only poorly preserved. The branchiostegal rays are sabre-like; only the four or five posteriormost rays are preserved.

- Axial skeleton. There are 17 caudal vertebrae, including the urostyle. We restore the abdominal portion of the vertebral column as consisting of 11 vertebrae, the 10 posterior of which are clearly visible. Most of what we regard as the first vertebra is not preserved; however, the tip of its neural spine is present below the second supraneural. We cannot exclude the possibility that one more, a 12th abdominal vertebra, was actually present but which is either not preserved or obscured by the pectoral girdle bones. The vertebral column is slightly curved and elevated anteriorly. The vertebral centra are shorten anteroposteriorly, and bear a longitudinal ridge on the lateral surface. The length of the caudal portion of the vertebral column is 1.6 times greater than the length of the abdominal portion of the vertebral column. The neural spines of the few anterior abdominal vertebrae are rather wide medially (especially those of the third to fifth vertebrae), whereas all the other neural spines are slender posteriorly in the abdominal region. The longest neural spines are those of the anterior caudal vertebrae. The haemal spines of the caudal vertebrae are relatively long, slender and pointed. The neural spines of the anterior caudal vertebrae are slightly shorter than the corresponding haemal spines and slightly less inclined posteriorly. The preepizygapophyses are strongest among the zygapophyses. The last four abdominal vertebrae have prominent parapophyses. Most of the pleural ribs are moderately long and slender, and moderately inclined posteriorly; a few of the anterior ribs are stronger and attached high to the vertebral centra. The ribs of the first pair seem to be at-

tached to the first vertebra (if our restoration of the abdominal portion of the vertebral column as consisting of 11 vertebrae is correct). Few epineurals are distinguishable.

- Pectoral fin and girdle. The posttemporal has a flat and elongate upper branch; the lower branch of the bone is unknown in the holotype. The supracleithrum is relatively large and elongate, and not serrated. The cleithrum is very incompletely preserved; it has a large posterodorsal projection above the pectoral fin. The postcleithrum is wedge-like in shape and pointed distally; it is oriented obliquely posteroventrally. The coracoid and scapula are not preserved. The pectoral fin is preserved at its base in the holotype; it consists of 15 rays. The pectoral-fin rays are fragmented and disarticulated distally. The pectoral-fin base is situated slightly closer to the vertebral column than to the ventral profile of the body, below the sixth vertebra.

- Pelvic fin and girdle. The pelvic bones are broad and each bone is tightly attached medially to its opposite member. There is a slender posterior medial process (postpelvic process) in the pelvic bone. The anterior ends of the pelvic bones seem to extend anterior to the cleithra. The pelvic fin is relatively long; it is inserted below the pectoral-fin base. There are five soft rays in each pelvic fin, in addition to the strong smooth pelvic-fin spine. The pelvic-fin spine almost equals in length to the longest anal-fin spine. The distal end of the pelvic fin reaches the first anal-fin spine.

- Supraneurals and dorsal fin. Two relatively short and exceptionally slender supraneurals (predorsal bones) precede the upper tip of the neural spine of the presumably first vertebra.

The dorsal fin is relatively long-based and continuous, with no indentation or space between the spiny and soft parts. The origin of the dorsal fin is above the third vertebra. The spiny part of the dorsal fin consists of 11 strong smooth spines; the first spine is shortest, 4.2 times shorter than the longest (fifth) spine. The second dorsal-fin spine is 2.3 times, and the third spine 1.45 times shorter than the fifth spine. The fourth spine is only slightly (1.12 times) shorter than the longest dorsal-fin spine. The dorsal-fin spines are relatively stout. The length of the longest spine slightly exceeds the length of the base of the spiny dorsal fin. The first two spines are in non-serial secondary association (supernumerary) with the first dorsal-fin pterygiophore, which precedes the neural spine of the presumably second vertebra. The soft part of the dorsal fin consists of 16 segmented rays. The dorsal-fin soft rays gradually decrease in length posteriorly in the series. The length of the base of the soft dorsal fin equals to the length of the base of the spiny dorsal fin. The dorsal fin ends above the 11th caudal vertebra. The pterygiophores of the dorsal fin penetrate down into the interneural spaces, with all the interneural spaces below the spiny dorsal fin having the ventral shaft of a single pterygiophore present, except for the second interneural space, which accommodates two pterygiophores. The interneural spaces below the soft dorsal fin have the ventral shafts of two (usually) or one pterygiophores present. The pterygiophores of the dorsal-fin spines are wide in lateral aspect whereas the pterygiophores of the dorsal-fin soft rays are narrower; the pterygiophores decrease in length posteriorly in the series. The dorsal-fin pterygiophores become more strongly inclined posteriorly in the series, with the last pterygiophore being almost horizontally oriented. The medial pterygiophores seem to be fused with the proximal ones.

- Anal fin. The anal fin originates below the third caudal vertebra; the length of the base of the anal fin is 1.14 times shorter than the length of the base of the soft part of the dorsal fin. The anal fin has three strong smooth spines and 12 soft rays. The second anal-fin spine is only slightly shorter than the third spine, which is the longest, 2.2 times longer than the shortest (first) spine. The first two anal-fin spines are supernumerary. The anal-fin soft rays gradually decrease in length posteriorly in the series. The anal fin ends under the 11th caudal vertebra.

The first pterygiophore of the anal fin is the longest; it is inclined obliquely posteriorly. The anterior border of the first anal-fin pterygiophore is almost straight. The distal ends of most of the anal-fin pterygiophores seem to be displaced from their natural position, with the sixth and seventh pterygiophores missing from the holotype.

- Caudal fin and skeleton. The caudal skeleton is of the generalized percoid type, showing the fusion of PU1, U1, and U2 in the terminal centrum. The neural spine of PU2 forms a relatively low crest. All five hypurals, the parhypural, and the haemal spines of PU2 and PU3 are autogenous. There are three epurals and probably a stegural formed by the first uroneural. The presence or absence of a second uroneural is not clear. The neural and haemal spines of PU3 are longer and stronger than those of the preceding vertebra. The caudal fin has 17 principal rays, with 15 branched (I,8-7,I). There are about six procurrent rays both above and below and procurrent spur. The caudal fin is moderately long and has concave posterior border.

- Squamation. The scales are moderately large and thin. The scales appear to be cycloid; no indications of ctenii are evident. There are delicate concentric circuli on the scale surface. The lateral line is not evident.

- Measurements of the holotype, in percent of SL (ca. 48.5 mm) are as follows (all measurements are recorded from the reconstruction in which the position of the anterior portion of the head is corrected):

Head length from tip of snout to posterior border of opercle: 39
Maximum body depth: ca. 51
Depth of caudal peduncle: 12
Distance between tip of snout and first dorsal-fin spine: ca. 47
Distance between tip of snout and first dorsal-fin soft ray: 69
Distance between tip of snout and anal fin: 69
Distance between pelvic fin and anal fin: 24
Length of base of spiny dorsal fin: 25
Length of base of soft dorsal fin: 25
Length of base of anal fin: 22
Length of first spine of dorsal fin: 5
Length of fifth spine of dorsal fin: 26
Length of last spine of dorsal fin: 24
Length of first spine of anal fin: 10.5
Length of longest (third) spine of anal fin: 23
Length of spine of pelvic fin: 22
Length of longest ray of caudal fin: >21
Preorbital distance: 10
Horizontal diameter of orbit: 17
Length of lower jaw: 28
Length of maxilla: 24

DISCUSSION

A general overview of the morphology of *Pavarottia* gen. nov. clearly support its alignment with percoid fishes. The new genus especially strongly resembles the percoid family Priacanthidae (see Fitch and Crooke, 1984; Starnes, 1988) in its general physiognomy and a number of its morphological features. Like the priacanthid genera, *Pavarottia* gen. nov. has

a relatively deep body, extremely large eyes, oblique and wide mouth, small conical teeth, the maxilla broad posteriorly, a relatively narrow opercular region, the ceratohyal lacking a "beryciform" foramen, a caudal skeleton of the generalized percoid type, a narrow postpelvic process, and a relatively long-based and continuous dorsal fin. At the same time, *Pavarottia* gen. nov. lacks such important priacanthid apomorphies (Starnes, 1988) as the modified spiny scales (spinoid scales: Roberts, 1993), the reduction of the supraneurals to one or none, the reduction in the vertebral number to 23, the reduction in the principal caudal-fin rays number from the primitive complement of 9+8 to 8+8, and possession of spinules on the fin elements. Additionally, the new genus has procurrent spur, one spiny and soft dorsal-fin ray more than recorded for the priacanthids, and the ribs of the first pair seem to be attached to the first vertebra rather than to the third as in priacanthids. Unlike the Priacanthidae, the vertebral count of *Pavarottia lonardonii* gen. et sp. nov. is somewhat increased from the plesiomorphic percoid number of 24-25 (Gosline, 1968; Johnson, 1984) to 28 (11 + 17). Therefore, *Pavarottia* gen. nov. cannot be accommodated in the family Priacanthidae.

Starnes (1988) did not find among the percoid families any candidate for the priacanthid sister group. Although priacanthids share a number of morphological conditions with scatophagids, "it is easy to dismiss most all shared conditions between priacanthids and scatophagids as probably homoplasous reductions linked to body foreshortening or, in the case of scale type, possibly plesiomorphic" (Starnes, 1988: 194). Perhaps *Pavarottia* gen. nov. is a better candidate for the priacanthid sister group, according to its general appearance and multiple shared characters.

The attempt of Sytchevskaya and Prokofiev (2003) to find relatives of the Priacanthidae among their fossil "family Asianthidae" of the late Paleocene generalized percoids cannot be regarded as successful. It has already been shown (Bannikov and Carnevale, 2007; Bannikov, 2010) that, since the only apomorphic character used by Sytchevskaya and Prokofiev (2003) to establish the Asianthidae is of poor taxonomic significance and has been misinterpreted by the authors, this family cannot be considered as valid.

The vertebral count of *Pavarottia* gen. nov. is somewhat increased from the plesiomorphic percoid number of 24-25 and is rather unusual for the Percoidei. Among 92 extant percoid families and *incertae sedis* genera listed by Johnson (1984: Table 120), only a few of acanthoclinids (now regarded as the subfamily of plesiopids: Smith-Vaniz and Johnson, 1990; Nelson, 2006), centrarchids, owstoniine cepolids, girellids, opistognathids, percichthyids and pseudochromids exhibit the vertebral formula of *Pavarottia* gen. nov. (11+17=28). However, representatives of these families differ greatly from the new genus in many other respects.

Dorsal- and anal-fin formulas of *Pavarottia* gen. nov. (D XI, 16; A III, 12) both lie completely within the ranges recorded in a relatively few percoid groups: families Caesionidae, Centrarchidae, Dinopercidae, Haemulidae, Opistognathidae, Oplegnathidae, Pentacerotidae, Percichthyidae, Plesiopidae, Serranidae, and *incertae sedis* genera *Hapalogenys* and *Siniperca* (Johnson, 1984: Table 120). None of these groups exhibit such diagnostic features of the new genus as, for example, extremely large eyes.

Therefore, because *Pavarottia lonardonii* gen. et sp. nov. is represented by a single relatively poorly preserved specimen, we believe that it is premature at present to either establish a new family for it or modify the diagnoses of any of the percoid families to accommodate the new taxon. We prefer to retain *Pavarottia lonardonii* gen. et sp. nov. *incertae sedis* within the generalized Percoidei near the family Priacanthidae.

ACKNOWLEDGEMENTS

LITERATURE CITED

AGASSIZ L., 1833-1844. *Recherches sur les poissons fossiles*. Tome IV, V. Petitpierre, Neuchâtel.

BALDWIN C.C., JOHNSON G.D., 1993. Phylogeny of the Epinephelidae (Teleostei: Serranidae). *Bulletin of Marine Science*, 52 (1): 240-283.

BANNIKOV A.F., 2010. *Fossil Vertebrates of Russia and Adjacent Countries. Fossil Acanthopterygian Fishes (Teleostei, Acanthopterygii)*. GEOS, Moscow, LXI + 244 pp. [In Russian].

BANNIKOV A.F., CARNEVALE G., 2007 (2005). The Eocene "*Dules*" *temnopterus* Agassiz, 1836 from Monte Bolca, and problem of classifying fossil percoid fishes. *Palaeontographia Italica,* 91: 69-84.

BANNIKOV A. F., TYLER J.C., 1995. Phylogenetic revision of the fish families Luvaridae and †Kushlukiidae (Acanthuroidei), with a new genus and two new species of Eocene luvarids. *Smithsonian Contributions to Paleobiology*, 81: 1-45.

BANNIKOV A. F., TYLER J.C., 1997. First discovery of a porcupinefish (Tetraodontiformes) in the Eocene of the North Caucasus. *Paleontological Journal*, 31 (6): 648-652.

BLOT J., 1980. La faune ichthyologique des gisements du Monte Bolca (Province de Vérone, Italie). Catalogue systématique présentant l'état actuel des recherches concernant cette faune. *Bulletin du Muséum national d'Histoire naturelle (Paris), sér. 4, section C*, 2 (4): 339-396.

FITCH J.E., CROOKE S.J., 1984. Revision of eastern Pacific catalufas (Pisces: Priacanthidae) with description of a new genus and discussion of the fossil record. *Proceedings of the California Academy of Sciences*, 43 (19): 301-315.

GOSLINE W.A., 1968. The suborders of perciform fishes. *Proceedings of the United States National Museum*, 124 (3647): 1-78.

JOHNSON G. D., 1984. Percoidei: development and relationships, *in* Moser H.G. et al. (Eds.), Ontogeny and systematics of fishes. *American Society of Ichthyologists and Herpetologists. Special Publication*, 1: 464-498.

MEDIZZA F., 1975. Il nannoplankton calcareo della Pesciara di Bolca (Monti Lessini). *Miscellanea Paleontologica. Studi e Ricerche sui Giacimenti Terziari di Bolca*, 2: 433-453.

NELSON J. S., 2006. *Fishes of the World. 4th ed.* John Wiley & Sons, Hoboken, New Jersey, 601 pp.

PAPAZZONI C. A., TREVISANI E., 2006. Facies analysis, palaeoenvironmental reconstruction, and biostratigraphy of the "Pesciara di Bolca" (Verona, northern Italy): An early Eocene *Fossil-Lagerstätte. Palaeogeography, Palaeoclimatology, Palaeoecology*, 242:21-35.

ROBERTS C.D., 1993. Comparative morphology of spined scales and their phylogenetic significance in the Teleostei. *Bulletin of Marine Science*, 52 (1): 60-113.

SMITH-VANIZ W.F., JOHNSON G.D., 1990. Two new species of Acanthoclininae (Ppisces: Plesiopidae) with a synopsis and phylogeny of the subfamily. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 142: 211-260.

SORBINI L., 1981. *I fossili di Bolca, II ed.* "La Grafica", Vago di Lavagno (VR). 134 pp.

STARNES W.C., 1988. Revision, phylogeny and biogeographic comments on the circumtropical marine percoid fish family Priacanthidae. *Bulletin of Marine Science*, 43 (2): 117-203.

SYTCHEVSKAYA E.K., PROKOFIEV A.M. (2003): A new acanthopterygian family, Asianthidae (Perciformes) from the Upper Paleocene of Turkmenistan. *Journal of Ichthyology*, 43 (1): 1-15.

TYLER J.C., BANNIKOV A.F., 1997. Relationships of the fossil and Recent genera of rabbitfishes (Acanthuroidei: Siganidae). *Smithsonian Contributions to Paleobiology*, 84: 1-35.

VOLTA G.S., 1796. *Ittiolitologia Veronese del Museo Bozziano ora annesso a quello del Conte Giovambattista Gazola e di altri gabinetti di fossili veronesi*. Stamperia Giuliari, Verona, 323 pp.

ALEXANDRE F. BANNIKOV
Borisyak Paleontological Institute of the Russian Academy of Sciences,
Profsoyuznaya 123, Moscow 117997, Russia
e-mail: aban@paleo.ru

ROBERTO ZORZIN
Museo Civico di Storia Naturale di Verona,
L.ge Porta Vittoria 9, Verona 37129, Italia
e-mail: roberto.zorzin@comune.verona.it