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LENISQUILLA CALIFORNIENSIS, A NEW SPECIES OF STOMATOPOD CRUSTACEAN

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INTRODUCTION

STOMATOPODS, OR mantis shrimps, are malacostracan crustaceans. Known as ''lean, mean, killing machines'' (Watling et al., 2000, p. 1), modern stomatopods are obligate carnivores, feeding exclusively on live prey (Schram, 1986). Characteristically, their second thoracic appendages are enlarged to form powerful, raptorial claws. Modern stomatopods are divided into two broad functional groups based on the shape and usage of their raptorial claws: 'spearing' and 'smashing' stomatopods (Caldwell and Dingle, 1976).

Spearing stomatopods are found in each of the seven stomatopod superfamilies (see Ahyong and Harling, 2000; Ahyong, 2001) and spear their prey, which is usually soft-bodied, with the spined terminal forelimb segment (dactyl) of the raptorial claw. Smashing forms are found within four families of the superfamily Gonodactyloidea (although the family Coronodidae within the superfamily Lysiosquilloidea has adaptations for both spearing and smashing). These stomatopods feed mainly on armoured prey such as crabs and gastropods.

There has been a large body of work on the taxonomy, functional morphology and behavior of extant stomatopods. At least 450 extant species have been described (Ahyong, 2001), but the fossil record of the group is poor; less than 30 fossil species from the Mesozoic through the Tertiary, and only four from the Paleozoic have been described (Hof and Briggs, 1997; Jenner et al., 1998). The occurrence of any new fossil material is therefore significant as it contributes important new data to help understand the evolutionary history of the group. In particular, important information can be gained regarding the evolution of spearing and smashing raptorial claws. It should be noted that, in spite of the general paucity of fossil stomatopods, the Miocene of California has previously yielded seven stomatopod specimens. Hof and Schram (1998) have suggested that this abundance, coupled with the demonstration by Hof and Briggs (1997) that stomatopods have relatively high preservation potential in comparison to other unmineralized invertebrates, suggests that the poor fossil record is probably due to collection and identification biases rather than decay and degradation.

In this note, a well-preserved spearing stomatopod from the collections of the Museo Civico di Storia Naturale, Milan, Italy (MSNM i 11824) is described as a new species within the superfamily Squilloidea, whose phylogeny has recently been studied by Ahyong (2005). The specimen is most likely to originate from the Miocene of California. The morphological terminology, measurements, and indices employed follow Manning (1969).

SYSTEMATIC PALEONTOLOGY

Class MALACOSTRACA Latreille, 1806
Subclass HOPLOCARIDA Calman, 1904
Order STOMATOPODA Latreille, 1817
Suborder UNIPELTATA Latreille, 1825
Superfamily SQUILLOIDEA Latreille, 1802
Family SQUILLIDAE Latreille, 1802
Genus LENISQUILLA Manning, 1977

Type species.—*L. lata* (Brooks, 1886)
Other species.—*L. gilesi* (Kemp, 1911); *L. californiensis* n. sp.

Diagnosis.—Eye elongate; cornea bilobed, broader than stalk, width less than 0.3 times carapace length. Carapace with or without anterolateral spines; median carina absent; with intermediate, reflected marginal and reduced lateral carinae, distinct anteriorly and posteriorly only; posterolateral margin rounded. Raptorial claw with four to six teeth; carpus dorsal carina undivided; merus without outer interferodistal spine. Mandibular palp three-segmented. Maxillipeds one through four with epipod. Pleopod one endopod in adult males with posterior endite; hook process with distal point. In thoracic somites five through seven lateral process a single slender spine directed anterolaterally, slightly inclined ventrally. Pleomeres one to five submedian carinae variably present. Telson submedian teeth with fixed apices; prelateral lobe indistinct; dorsolateral surface without supplementary longitudinal carinae. Telson ventral surface with short postanal carina. Uropodal protopod inner margin with slender spines. (Emended from Ahyong, 2001).

LENISQUILLA CALIFORNIENSIS new species
Figures 1, 2

Diagnosis.—A moderately sized stomatopod, approximately 60 mm long. Small, narrow, flask-shaped eyes; rounded ocular scales. Elongated antennular somite. Carapace with no anterolateral spines, anterolateral portion not sloping posteriorly, rounded posterolateral angles and narrowing rapidly anteriorly. Dactyl of raptorial claw armed with four to five teeth. First five pleomeres with longitudinal pairs of submedian, intermediate and lateral carinae. Telson broader than long with distinct median carina, three pairs of marginal teeth and eight to ten intermediate denticles on each side.

Description.—Specimen MSNM i 11824 is a well-preserved, moderately-sized stomatopod approximately 60 mm in length (Fig. 1.1) showing the cephalic region (including eyes, ophthalmic somite, antennular somite and appendages, and antennal appendages), the carapace and basal part of the rostral plate, the raptorial claws, the fifth through eighth thoracic somites, the first four pleomeres and part of the fifth, and the telson.

The specimen has an ophthalmic somite bearing stalked eyes. These eyes are not preserved in great detail but their outline is visible in places; they are small and flask-shaped (i.e., short and stout with a straight inner margin of the anterior third, and a convex outer margin). The cornea (Fig. 2.1, 2.2) is narrower than the maximum width of the eyestalk (Fig. 2.1, 2.2). The ocular scales appear fused into a single plate (Fig. 2.1, 2.2). The anterior margin of the opthalmic somite projects forward, although the apex is not preserved.

The antennular somite is somewhat elongated (Fig. 2.1, 2.2). The antennular processes (Fig. 2.1, 2.2) are patchily preserved but their outlines are visible; they are slender and quadrate in form. The first segments of each of the antennules (Fig. 2.1, 2.2) are stretched out anteriorly and are vertically juxtaposed beneath the eyes. The antennules are approximately equal in width to the eyes except for at their base where they are widened. Here their outer margins are visible as curved structures lying outside the outer margins of the eyes. The antennal appendages are clearly preserved on the right hand side of the specimen. The second segment of the antennal protopod is apparent. Both segments of the antennal exopod are also visible. Only the proximal part of the antennal scale (Fig. 2.1, 2.2) is preserved. Only the first two segments of the antennal endopod are present.

Only the basal part of the rostral plate is visible, its basal width is approximately one third that of the anterior margin of the carapace. However,