Preliminary data on the Gnathiidae (Iscpoda) of the Northern Red Sea, the Bitter Lakes and the Eastern Mediterranean and the Biology of Gnathia piscivora n.sp.

by

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Abstract

Seven species of Gnathiidae are reported from the northern Red Sea, the Eastern Mediterranean and the Great Bitter Lake. A new species - Gnathia piscivora - is described, as well as data on its biology and host-parasite relationship.

Résumé

Sept espèces de Gnathiidae sont reportées au Nord de la Mer Rouge, à l'Est de la Mediterranée et dans la Grand lac Amer. Une nouvelle espèce est décrite ainsi que des données sur sa biologie et ses relations hôte-parasite.

Gnathiidae larvae, "pranizae" were collected from fish from the northern Red Sea and from the Mediterranean coast of Israel. The collected live engorged larvae were reared in vitro to adult stage. Adult and larval Gnathiidae were also collected from dredge samples (10 m depth) from the Great Bitter Lake of the Suez Canal. In Gnathiidae, so far, specific differentiation was made on the basis of adult males alone. Adult male taxonomy is based on the comprehensive monograph of Monod (1926), followed by further records of males collected in benthic surveys. Taking into account the present state of affairs in literature, the seven species recognized in our material could be identified only tentatively, on basis of male morphology. Morphological and taxonomical study of female and larval forms is now in progress.

Two species, both of the genus Gnathia were collected from selachians, from Dasyatis uarnak and Isurus oxyrhynchus (a third species not yet identified was found on Sphyraena mokkaram). Gnathiidae from selachians appear to be highly host specific, being attached to the gills and the gill septae.

The most frequent species in the Red Sea material was Gnathia piscivora n.sp., while Gnathia vorax (Lucas) is widespread in our Mediterranean material. Pranizae of both species are non-specific parasites, G. piscivora are also not selective in their preference for site of attachment and attach both to skin, gills and the walls of the pharyngeal and branchial cavities of Mullidae, Lethrinidae, Sparidae, Carangidae, Tylosuridae and Mugilidae. G. vorax attach to the mouth cavity and gills of Sparidae, Serranidae and Mugilidae (especially Chelon labrosus).

Two other Red Sea species, Gnathia aff. nipponensis Monod and Elaphognathia sp. have been collected in too few cases for allowing conclusions about their biology.

The species collected from the benthic material from the Great Bitter Lake is clearly allied to Gnathia regalis Monod, however, the penis is reduced as compared to the typical species. Gnathia cf. regalis is the first report of Gnathiidae from the Suez Canal and indicates that fishes living under the high salinity conditions of the Bitter Lakes (± 47°/oo) are nevertheless vulnerable to these parasites.

Gnathia piscivora new species. Holotype: adult male, HUJ-CR. Elat, Gulf of 'Aqaba.

Preliminary description

Male: Size 4-5 mm. Cephalon square, without ocular tubercles. There are pointed supraocular processes; the superior frontolaterals are bilobate; the fronto-median process has four lobes forming a pointed, bifide complex. Third pereion has no latero-anterior processes. Fifth pereion with developed postero-lateral lobes. Pleon covered with long hair. Telson with two terminal setae and about 6-7 lateral spinulae. Antennular peduncle with third segment claviform and bearing strong hairs. Antennae with 4-segmented peduncle: third segment nearly as long as the fourth. Mandibulae bear two mandibular setae. Phyllopode with a reduced and sunken-in third joint. Pereiopods 4 and 5 with Wagnerian glands and very prominent bulges on the meropodite. Pleopods setigerous; second pleopod without appendix masculina. Uropods squarish. Penis is a thin-pedunculate mushroom-like structure. Anterior surface, on both sides of the vas efferens, covered with softish spines. Lateral surfaces present, two areas covered with scales.

The only species known to have a slightly inflated penis is Gnathia phallonajopsis Monod; however, G. piscivora n.sp. differs from this species in many other aspects.

Host-parasite relationship in G. piscivora

G. piscivora being indiscriminate in host selectivity and haematophagous, pose a risk to marine fish confined to cages. It also causes damage to commercial fishing by destroying the skin and hence the marketing quality of fish caught in gill nets. Victims, fish in cages and fish entangled in gill nets, when attacked by a large number of pranizae exhibited numerous integumentary wounds, extensive dermal hemorrhages and bleeding. Some fish died while infested, the survivors, anaemic and stressed, succumbed the following day; fish rarely survived heavy attack of pranizae. Pranizae attach to skin become engorged and

leave their host within 2–4 hours; those attached to the gills or the walls of the pharyngeal cavity may remain attached, after engorgement, for longer periods, one or more days. Pranizae attack fish only at night and only in shallow (less than 2 m depth) waters.

Life Cycle of Gnathia piscivora

Preliminary observations on the life cycle of Gnathia piscivora n.sp. showed that pranizae underwent at least three sessions of engorging and molting before the final molt to free-living adult. Detached small pranizae which have been prevented from completing their full course of meals also molt to adult stage, however, they are smaller in size; such females produce fewer eggs. Engorged young larvae may starve for over a month; however, they will readily feed three days after their last meal. The life cycle was reproduced in the laboratory at 24°C. The pranizae molted to adults 7–10 following the last meal, eggs developed in females before the final molt occurred. Eggs developed in the female's brood pouch and hatched after 22–24 days. Larvae emerged through a slit in the brood pouch. One female gave progeny of up to 200 larvae. Females died soon after hatching was completed. Emerging larvae did not feed; after 7 days they molted and became infective to fish.

Reference

MONOD, Th., 1926. Les Gnathiidae. Essai Monographique (Morphologie, Biologie, Systematique). Mem. Soc. Sci. Nat. du Maroc. No. XIII, 668 pp.