

Intersexuality in the Arctic Isopod *Mesidotea* (= *Saduria*) *sibirica*

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An intersex individual of the isopod *Mesidotea sibirica* was found among 50 specimens taken from collections obtained in Pauline Cove, Herschel Island, Yukon Territory, in the summer of 1975. This is the first such intersex form reported for *M. sibirica*. Intersexuality has not been reported previously among isopods of the genus *Mesidotea* (Richardson, 1905; MacGinitie, 1955; Bray, 1962; McCrimmon and Bray, 1962; Robilliard and Busdosh, 1979; Percy and Fife, 1980; Percy, 1983).

The individual resembles a mature female externally by possessing on the ventral surface a fully developed marsupium (Fig. 1) consisting of five pairs of oostegites and two genital ducts on the fifth thoracic segment, and internally by possessing two ovaries laden with ova. It also resembles an immature male externally by possessing two small and erect genital papillae (Figs. 1 and 2) on the ventral surface of the seventh thoracic segment, however, copulatory stylets are absent and there is no indication of a male reproductive system internally. External male characters of normal sexually mature *Mesidotea* spp. males include two genital papillae on the ventral surface of the seventh thoracic segment which project caudally, and copulatory stylets on the second pleopods (Haahtela, 1978).

The intersex individual is 73 mm in total body length measuring from the head notch to the tip of the telson. It is within the size range of normal *M. sibirica* females with larvae in the marsupium captured in the Herschel Island waters in summer 1975; total body length ranged from 56 to 74 mm (\bar{x} = 62.6 mm) (Percy, 1983; Percy and Fife, 1980). Sexually mature (*M. sibirica*) males captured in the Herschel Island waters are larger in total body length than normal sexually mature females (Percy and Fife, 1980).

Parasitism has been associated with intersexuality in several crustaceans (Munro, 1953; Hartnoll, 1962; Noble and Noble, 1973; Bulnheim, 1975, 1978; Hastings, 1981). Bulnheim (1975) suggested that microsporidian exudates may affect the differentiation of the androgenic gland during post-embryonic development. Parasitism may be a plausible explanation for the intersex form of *M. sibirica*, since the isopod population in the Herschel Island waters was found in the summer of 1975 to be internally infected with an extracellular protozoan (Korczyński, 1983). However it is not known whether the intersex is infected with the protozoan as there is no gross external manifestation of the infected condition (Korczyński, 1983). Histopathological examination is required to ascertain whether infection is present in the body tissues.

The length of photoperiod as an environmental factor has been experimentally determined to have an influence on sex

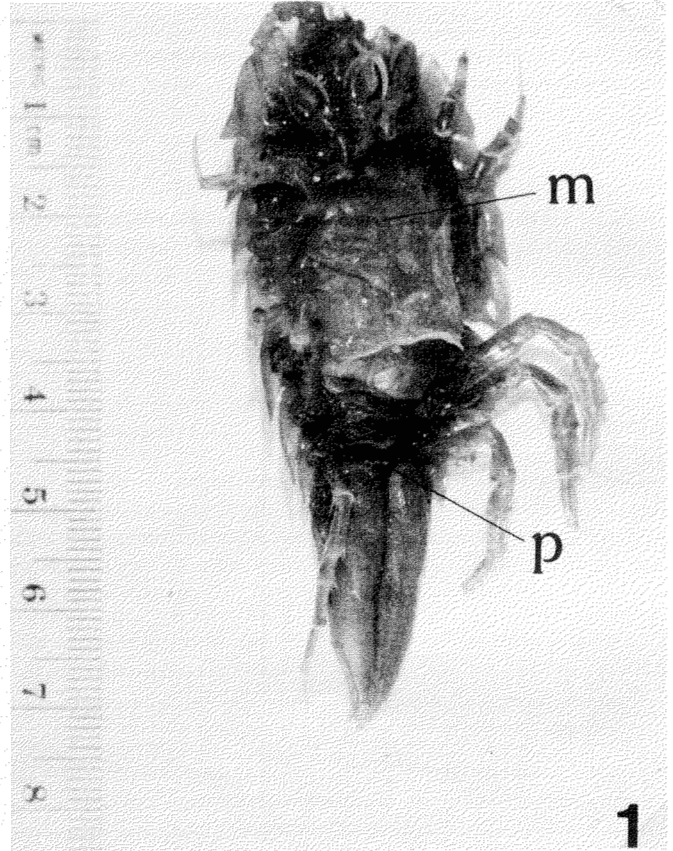


FIG. 1. The intersex individual of *Mesidotea sibirica* shows the marsupium (m) and genital papillae (p).

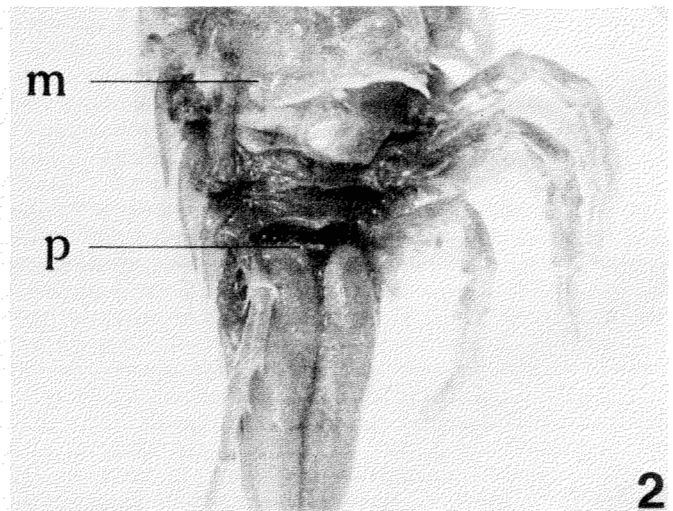


FIG. 2. Higher magnification of the external sexual characters shows the lower half of the marsupium (m) and the two genital papillae (p) X2.

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differentiation (Bulnheim, 1978). In contrast to photoperiod, temperature and salinity fluctuations play an indirect role as regulating factors in sex differentiation of offspring from parasitized females (Bulnheim, 1978).

It has been suggested that intersex individuals of *Gammarus minus* may exhibit protogynic hermaphroditism typical of some crustaceans (Buikema *et al.*, 1980). There has been no documentation as to whether individuals of *M. sibirica* change from functional females to functional males with age.

More research on developing *M. sibirica*, the environmental influences impinging on the isopod population as a result of the prevailing wind effects on the Mackenzie River outflow into the Herschel Island waters (Korczyński, 1983), and the effects of parasitism on the isopod population are necessary before a causative factor(s) can be determined.

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