Within the family Palinuridae, external fertilization is only known to occur in the genus *Panulirus* in which the conspicuous spermatophoric mass with a hard protective matrix is well known. External spermatophores have not been recorded in other palinurid genera.

In the course of examination of a sample of *Palinurus gilchristi* Stebbing, 1900, trawled off the Natal coast, five females were found to have spermatophoric masses on their thoracic sterna, indicating that external fertilization occurs in this genus. The spermatophoric mass was complete in only one specimen which was in a state immediately prior to oviposition. In the other specimens oviposition had just occurred and the spermatophoric masses were fragmented, presumably due to fertilization. The exoskeletons of all five specimens were hard.

The spermatophoric mass, which is opaque-white, soft and jelly-like, is spread evenly over the entire surface of the last sternal plate of the thorax and extends anteriorly onto the preceding sternal plate, posteriorly onto the arthrodial membrane of the abdomen, and laterally onto the coxopodites of the fifth pereiopods. It is roughly bilaterally symmetrical and the portions extruded from each gonopore of the male are clearly distinguishable as two rounded patches (Pl. I). The seminal fluid within each vas deferens consists of a clear matrix in which is coiled a white tube-like spermatophore containing spermatozoa. This is typical of descriptions of the seminal fluid in other palinurid genera (Heydron, 1965). Microscopic examination of the external spermatophoric mass, however, shows that the spermatozoa are spread diffusely throughout the jelly-like matrix. It appears, therefore, that the delicate spermatophores rupture when the spermatophoric mass is spread onto the sternum of the female, thus releasing the spermatozoa. In *Panulirus* the external spermatophores do not rupture and the spermatozoa remain localized within them.

The thoracic sternum of the female lacks setae and the only apparent adaptation for attachment of the spermatophoric mass is the absence of a median tooth on the last sternal plate, thus making the surface flatter than in the preceding segments. The spermatophoric mass is sticky and adheres strongly to the sternum of the female.

In *Panulirus* the spermatophoric mass may be carried for several days or even weeks before fertilization and the hard protective matrix is probably an adaptation for shallow turbulent water where an unprotected spermatophoric mass would be
washed off. In a deep-water environment it is unlikely that the spermatophoric mass of *P. gilchristi* would require a specialised protective matrix, particularly if fertilization and oviposition occurred sooner after mating than in *Panulirus*. The unspecialised spermatophoric mass of *P. gilchristi* may well represent a primitive condition which would be in keeping with the views expressed by George & Main that *Panulirus*, which has invaded shallow water, is the most recently evolved genus.

Internal fertilization has been postulated in the genus *Jasus* by Gilchrist (1913, 1918), Von Bonde (1936), and Fielder (1964). Recently, however, Paterson (1968) has made a comprehensive assessment of the problem of fertilization in *Jasus lalandii* (H. Milne Edwards), and concludes that internal fertilization is unlikely to occur in this species. She suggests that in view of similarities in the genital apparatus of *J. lalandii* and *P. gilchristi*, observations on the mating behaviour of *P. gilchristi* may provide decisive clues to the method of fertilization in *Jasus*.

Occurrence of an unprotected, external, spermatophoric mass in *P. gilchristi* would seem to support Paterson’s contention that external fertilization may occur in *Jasus* and this could well be the case in other Palinurid genera which also show little specialization in the genital apparatus. While histological comparison of the oviducts of *Jasus* and *P. gilchristi* and further study of the genital apparatus of the rarer, deep-water Palinuridae may add to the circumstantial evidence for external fertilization, this will only be proven conclusively in these genera if external spermatophores are found and a close watch should be kept for them.

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