

When pollen grains of *Silene tatarica* were used, mature and normal embryos developed but they were not transferred to a fresh medium and their further growth was not examined.

A few of the ovules dusted with pollen grains of *Dianthus carthusianorum* were fertilized and young embryos (in the stage of young cotyledons) were developed. Due to a shortage of this material and high percentage of infections, we did not succeed in obtaining mature embryos. Further efforts will be undertaken in order to culture mature embryos and seedlings.

Detailed embryological and cytological studies of the above described experiments are carried out and the results will be reported elsewhere⁶.

Zusammenfassung. Samenanlagen von *Melandrium album* wurden mit Pollenkörnern der folgenden Arten

befruchtet: *Melandrium album*, *M. rubrum*, *Silene schafta*, *S. tatarica*, *Dianthus carthusianorum*. Es wird die weitere Entwicklung der Embryonen beschrieben.

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Orthomorpha sp. - a New Predatory Millipede on *Achatina fulica* in Andamans

While working on the biological control of *Achatina fulica*, the giant African snail, a species of millipede was found to be in association with snails at Port Blair in the South Andamans. It was suspected that the millipedes may be feeding on the snails; to investigate this, specimens of millipede were brought to the Indian Agricultural Research Institute, New Delhi. The millipede started breeding and multiplying in large numbers on the onset of the monsoon in July, in our snail-rearing laboratory. This breeding season actually coincided with the breeding season of the snails. A number of empty shells of *Achatina* (especially of the young ones) were observed to be present in the snail-rearing laboratory. This was not a normal feature in previous years when there were no millipedes in the snail-rearing rooms. One day, from a particular spot which was demarcated, all the empty shells of giant African snail were removed. Three days later it was observed that even at that spot from where the empty shells had been removed, several empty *Achatina* shells were lying - many of them full of millipedes of various age groups. Three snails, about 8 months old, were seen in a partly eaten state. This gave the clue that millipedes feed upon *Achatina*.

Laboratory experiments were laid out in jars: one jar containing soil, roots, leaves, millipedes and snails of about 1 cm shell length, and the other containing everything as in jar one except millipedes. This experiment was repeated 3 times and several replications were made. The number of millipedes and snails in each case were 50 and 5 respectively. It was observed that within 5 days the snails were eaten away.

After this, several 18 × 15.5 cm jars, open at both ends, were placed 6 cm deep in the soil and 100 millipedes were released on the soil surface enclosed by these jars in such a way that every alternate jar was without millipedes, to serve as a check. It was observed that even big-sized snails fell victim to the attack of millipedes, but they were never found attacking the actively moving snails. Certain millipedes are known to secrete poisonous chemicals like phenols¹ and hydrocyanic acid² from their stink glands, whose importance in the defence mechanism of the animal is already known. It was observed that when the snails were resting on the soil surface, the millipedes attacked them from below many at a time. It appears

that since large numbers of millipedes attack the snail several times, the secretion of the stink glands is enough to inactivate the snails to such an extent that ultimately they are not able to repulse the attacks, and the millipedes start feeding on them by scraping their body surfaces. It was further observed that in some cases the millipedes not only feed upon the snails but also make the shells their regular abode after they have fed upon the animal contained therein. Millipedes have been said to feed on the 'underground part of plants'³ and 'on decaying vegetable matter'⁴. They have also been said to be 'largely herbivorous'⁵, 'but also will eat animal matter'⁶ and sometimes dead worms, molluscs, insects, etc.⁷.

The millipede has been identified as *Orthomorpha* sp. (Order Proterospemphora, Family Strongylosomidae). Secretions of the stink gland have stood the sodium picrate and copper acetate-benzidine acetate tests for hydrocyanic acid. Details of the secretion and the mechanism of killing are under study⁸.

Résumé. Un mille-pieds, *Orthomorpha* sp., a été observé se nourrissant d'*Achatina fulica*. Ces Myriapodes injectent la sécrétion toxique de leur glande fétide dans les limaçons pour les immobiliser.

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¹ T. EISNER, J. J. HURST and J. MEINWALD, *Psyche*, Camb. 70, 94 (1963).

² H. E. EISNER, T. EISNER and J. J. HURST, *Chemy Ind.* 3, 124 (1963).

³ M. S. MANI, *Introduction to Zoology* (Malhotra Bros. 60, Daryaganj, Delhi 1950), p. 341.

⁴ J. N. COMSTOCK, *Introduction to Entomology* (Comstock Publ. Co. Inc., Ithaca, N.Y. 1950), p. 17.

⁵ P. B. WEISZ, *The Science of Biology* (McGraw-Hill Book Co. Inc., New York, Toronto, London 1959), p. 750.

⁶ T. I. STORER and R. L. USINGER, *General Zoology* (McGraw-Hill Book Co. Inc., New York, Toronto, London 1957), p. 454.

⁷ J. C. CLOUDESLEY-THOMPSON, *Spiders, Scorpions, Centipedes and Mites* (Pergamon Press, London, New York 1958), p. 26.

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