

THE AUSTRALIAN SPECIES OF *TOSIA* (ASTEROIDEA).

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(Plates xliii-xliv.)

The opinion held by Fisher (1911) that the Australian forms are best kept together in the genus *Tosia* and the American and European forms relegated to allied genera such as *Ceramaster* and *Plinthaster*, appears to be not only the most reasonable solution to the problem, but also the most natural course out of a maze of difficulties. The proposition, however, solves for the present only part of the task for the systematist and, indeed, must be regarded as only an initial step in the reorganization of sea-stars of the Australian seas. A problem yet to be faced is the relationship of *Tosia* with *Pentagonaster*, which is not yet clearly understood, but it is felt that, when the question is fully investigated by one with sufficient data, the merging of both genera will be the only alternative.

Just as intricate and detailed is the task of separating the species. It is the purpose of the present paper to attempt a reorganization of the Australian species so far as available material will allow; to give the results of a study of the relative values of specific characters and a statement of their uses and practical application. Moreover, it will be of great assistance to future workers to have the Australian species assembled under one heading and to have also a range of figures which will render the species more easily recognizable.

The species mentioned herein are as follows; the status of each species is included:

Tosia australis Gray, genotype (valid).

T. aurata Gray (valid).

T. astrologorum (M. and Tr.) (a synonym of *T. australis*, or, at most, only a variety of that species).

T. tubercularis Gray (valid).

T. grandis Gray (? synonym of *T. aurata* Gray).

T. rubra Gray (doubtful).

T. queenslandensis Liv. (valid).

T. minima (= *Pentagonaster minimus*) (Perrier) (in synonymy of *T. tubercularis* Gray).

THE GRANULATION OF THE ACTINAL SURFACE AS A SPECIFIC CHARACTER.

(Only species represented by series are discussed under this head.)

(a).—In *T. aurata* Gray.—In this species the actinal granulation is not governed by growth. Four specimens of almost equal size (three with R. = 36 mm. and one with R. = 33 mm.) show the character to vary to a marked degree. In