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Variations in Pultenaea juniperina Labill.

By

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The genus *Pultenaea* Smith, endemic in Australia, is one of the largest genera of Australian legumes. Seventy-five species were recognised by Bentham (1864), and of these, fourteen are recorded from Tasmania.

Pultenaea juniperina Labill. is abundant throughout Tasmania, being found in a wide range of habitats at all altitudes between sea-level and 4000 ft. The plant, which forms an erect much branched shrub several feet in height, bears simple pungent, evergreen leaves ¼ to ½ an inch in length, each leaf spreading approximately at a right angle from a short petiole, which is adpressed to the stem. Small stipules are present.

There is a considerable degree of variation in the shape of the leaves of *P. juniperina*, the range in shape being from linear to narrow ovate. The leaves are concave, having incurved margins. One wide-leaved and distinctive form of the plant was distinguished by Bentham as *P. juniperina* var. *latifolia*. This form had previously been raised to specific rank by Graham, who described it as *P. cordata*. Although the general appearance of the latter plant is markedly different from that of *P. juniperina* Labill. this difference is due entirely to the leaves, which are broad, often cordate, at the base and closely crowded on the stems (fig. 5). There are no essential differences in the structure or form of the flowers. Hooker (1860), while recording the two species *P. juniperina* Labill. and *P. cordata* Grah. expressed the opinion that the latter might prove to be a variety of the former—the view adopted by Bentham.

In the present study of the taxonomic status of *P. juniperina* Labill. var. *latifolia* Benth., the chromosome complement of this plant was compared with that of the type. Counts of the somatic number of chromosomes were made from mitotic figures in root tips. The roots were taken from the plant illustrated in fig. 5, and from seedlings obtained from the plan shown in fig. 4. Root tips were fixed in the Craf modification of Navashin's solution, sectioned at 12μ and stained in Haidenhain's iron-alum haematoxylin. The chromosome complements at somatic mitosis are illustrated in figs 6, 7: thirty-six chromosomes are found in *P. juniperina* Labill. and twenty-seven in *P. juniperina* Labill. var. *latifolia* Benth.

These results suggest a basic chromosome number of nine, the specimens of *P. juniperina* examined, being tetraploid, and the variety *latifolia*, triploid.

This hypothesis is consistent with observations on the method of reproduction of the plants. While the flowers of *P. juniperina* form abundant viable pollen

and set seed from which plants establish readily, in the variety *latifolia* all the flowers examined have contained only abortive and shrivelled pollen grains. The latter plant spreads vegetatively, sending out vigorous underground stems. *P. juniperina* may also spread by similar vegetative means as well as by the production of seeds.

Several questions raised by these observations can be answered only through further investigations. *P. juniperina* var. *latifolia*, though less widespread in Tasmania than the type, is locally abundant in widely separated areas. The possibility of the occasional production of seed by this plant cannot be excluded. However, it is conceivable that a study of the chromosome complements of a number of specimens representative of the range of variation normally found in *P. juniperina* Labill. may provide a clue to the origin of the distinctive variety *latifolia*.

This problem is one that arose during the course of investigations carried out whilst in receipt of a Commonwealth Research Grant. I should like to express my thanks to Dr. H. D. Gordon for his advice.

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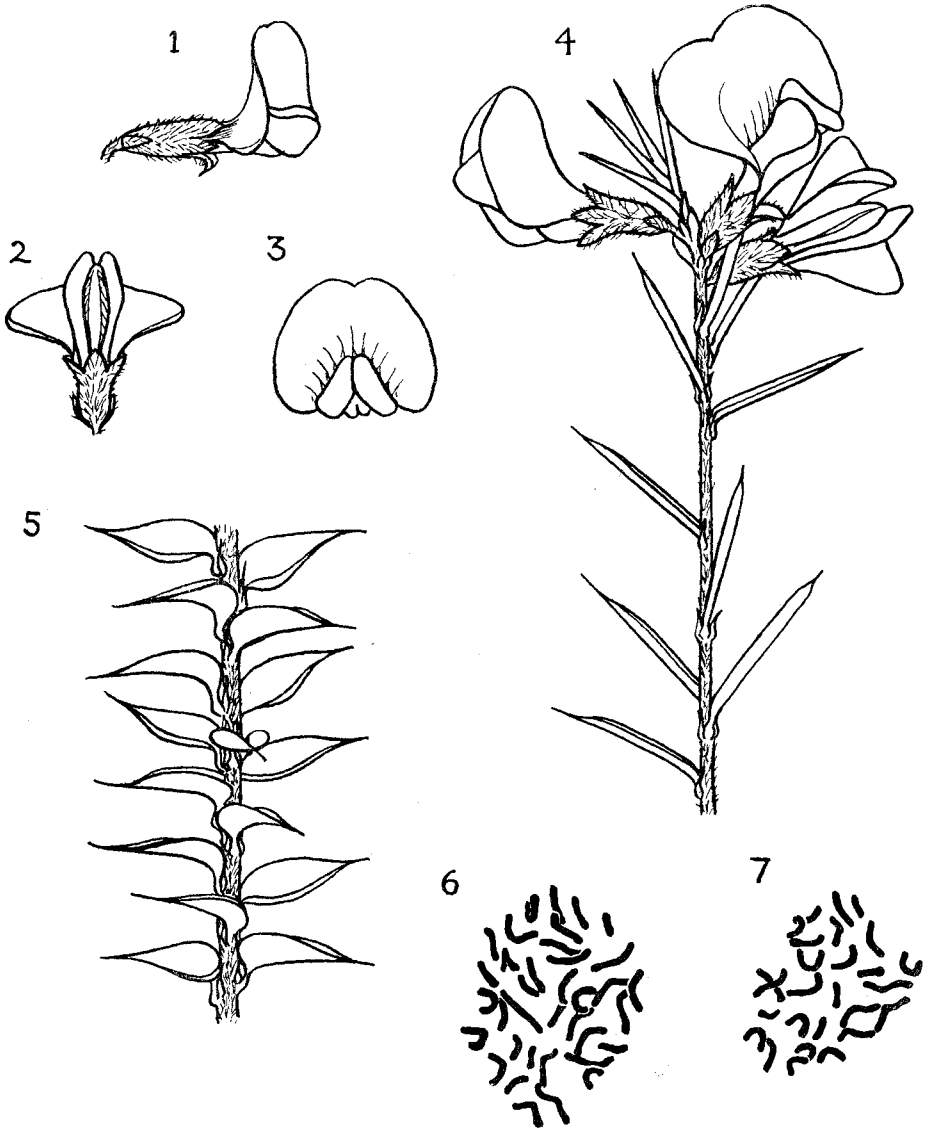
FIGS 1 to 4.—*P. juniperina* Labill. Flowers × 2.

FIG. 5.—*P. juniperina* var. *latifolia*. Branch × 2.

FIGS 6, 7.—Diagrams made with camera lucida × 2,500. 6, *P. juniperina* Labill. 7, *P. juniperina* Labill. var. *latifolia*.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