

being mediated by sense organs located in the mantle musculature. This indicates that sensory pathways of several modalities located in the mantle region converge on units in the supra-oesophageal ganglion.

These results support the theory of chemoreception as a function of the osphradium at least in *Buccinum undatum*. Failure to record activity in response to light tactile stimulation suggests that the osphradial mechanoreceptors, if any, are insufficiently sensitive to act as sediment detectors as suggested by Hulbert and Yonge. During the course of the experiments it has been noted that copious production of mucus occurs from the hypo-branchial gland, osphradium and mantle surface. This must severely impede the entry of particles into the mantle cavity in the natural situation and their contact with any part of the mantle surface.

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Suppression of Gemma-cups in *Marchantia* by High Humidity

It was noticed that gemma-cups in the New Zealand liverwort *Marchantia berteroana* L. and L. (= *M. tabularis* Nees) were not produced when the pots were covered with glass or polythene sheets. That this effect is the result of increased humidity has been confirmed by growing plants in the saturated atmosphere of a permanent-spray house, but protected from direct falling water. All experiments were carried out on sets of 60 plants, started from disks of *Marchantia* thallus 1 cm in diameter, grown in pots of sterilized garden soil. In all experiments except the second every disk had its counterparts, cut from the same thallus, in the corresponding position in each treatment so that the material under the different treatments was exactly comparable.

In one representative experiment no gemma-cups at all were produced on a unit of 60 plants during nineteen weeks' growth in a saturated atmosphere, whereas the control plants in normal air out of doors had, in the same time, produced a total of 234 gemma-cups (mean 3.9 ± 0.98 /plant). This difference is highly significant ($P < 0.001$).

A second experiment, using twice as many plants, resulted in a total of 10 gemma-cups (mean 0.08 ± 0.75 /plant) in saturated air compared with 1,049 cups (mean 8.74 ± 1.18 /plant) in normal air. The difference is again highly significant ($P < 0.001$).

A similar effect was shown by a third experiment in which units covered with sheet polythene or uncovered were grown in cabinets at three different temperatures, averaging approximately 5°, 10°, and 15° C. The uncovered plants produced 2 (5° C), 9 (10° C) and 175 (15° C) gemma-cups totalling 186, while the covered plants produced no gemma-cups even at 15° C. The total production of gemma-cups was low, probably as a result of the comparatively high ambient relative humidity (about 75 per cent) in the cabinets.

Table 1 presents the results of a fourth experiment, where batches of 6 plants were transferred into the spray

Table 1. EFFECT OF INCREASING EXPOSURE TO DRY CONDITIONS ON NUMBER OF GEMMA-CUPS FORMED. COUNTS MADE AFTER 106 DAYS. SIX PLANTS IN EACH TREATMENT

Days in dry conditions	1	2	4	8	16	24	32	40	48	56
Total No. of gemma-cups	1	6	0	1	11	61	36	58	56	78
No. of plants forming gemma-cups	1	1	0	1	4	5	6	6	4	6

house after increasing periods in dry air out of doors. The equation for the regression of number of gemma-cups formed on days of dry conditions is $y = 30.8 + 1.40(x - 23.7)$, which is highly significant ($P < 0.001$).

After the end of these experiments the plants produced gametangiophores and it was possible to determine their sex, revealing that, in the material used, male plants are able to produce far more gemma-cups than are female plants. For the second experiment, the pooled comparative mean numbers of gemma-cups per plant are 60.13 ± 7.52 for male and 4.29 ± 4.48 for female plants. This difference is not due merely to the male plants being larger, since the average number of gemma-cups per unit of area of the thallus is male $0.87/\text{cm}^2$ compared with female $0.07/\text{cm}^2$. The sex difference also accounts for the rather low numbers of gemma-cups on the plants of the first experiment, for all these turned out to be female.

The precise humidity which is responsible for this suppression of gemma-cup formation is not yet known.

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The Genus *Oceanopapaver*

THE monotypic genus *Oceanopapaver* was established for the naming of *O. neocaledonicum* by Guillaumin¹. Because of certain characters which need not be discussed here he relegated his new genus to Papaveraceae. Friedel² cast some doubt on this classification and suggested that the plant showed a number of characters not unlike those of the Cistaceae. Fedde³, in a review of the Papaveraceae, expressed scepticism about allocating this new genus to that family. Among other criteria he saw some difficulty in finding a papaveraceous plant endemic to the tropical New Caledonia in the southern hemisphere.

Thanks to Prof. H. S. McKee, Commonwealth Scientific and Industrial Research Organization, Canberra, Australia I was able to make an examination of this plant for alkaloids. 400 g of dried material were available, collected when only a few of the seeds had matured. Fortunately this is the stage in most herbaceous plants when the alkaloid content is at a maximum.

The coarsely ground material was thoroughly extracted with methanol, the methanol was evaporated from the extract, the latter extracted with slightly acidified water, the aqueous extract filtered, and exhausted with repeated fresh portions of ether. (The ether extract failed to yield fumaric acid—a common constituent of papaveraceous plants.) A test portion of the aqueous extract did not give a precipitate with potassium mercuric iodide—a test which when positive is an almost certain indication of alkaloids. So far no alkaloid-bearing plants are known which give a negative test with this reagent.

Nevertheless, the aqueous solution was rendered basic with ammonia and extracted with several successive portions of chloroform. The residue from the latter was stirred with aqueous oxalic acid, the filtered solution exhausted with ether, made alkaline again, and extracted with chloroform. The residue from the latter dissolved only partly in dilute acid and the solution did not give a precipitate with the aforementioned reagent.

Inasmuch as all plants of the Papaveraceae, which have so far been examined, have yielded alkaloids, their complete absence in *O. neocaledonicum* can be regarded as sufficient cause for relegating this plant to another family.

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