

and (3) the adaxial folding of the pinnules. All these are of special value for a thorough understanding of the morphology of the sporocarp in the Marsileaceae.

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1. Bower, F. O., *The Ferns* II, 1226. 2. Eames, A. J., *Morphology of Vascular Plants, Lower Groups*, 1936. 3. Johnson, D. S. and Chrysler, M. A., *Amer. J. Bot.*, 1938, 25, 141-56.

### INFLUENCE OF DEPTH OF FURROWS IN THE IRRIGATION OF POTATOES

THE experiment was conducted to find out under Delhi conditions, the optimum amount of water required to mature the potato crop and give the most economic return of tubers. The treatments were (1) Irrigation: 5, 7 & 9 each of 3" depth (2) Depth of furrows 4½", 6" and 9". (3) Nitrogenous fertilizers 40, 80 and 120 lb. N/acre. The layout was of 3 × 3 × 3 partially confounded design with two replications having 3 blocks in each. Each block had 9 plots and each plot was of 24' × 15', i.e., 1/121 acre in area. 2' border was kept between the plots. Irrigation water was measured with a 90° notch. The rainfall was 4.56" spread over the growing season. There was no run off. The water table fluctuated between 15' and 11' from the surface. The variety of potato was *Phulwa*.

Statistical analysis of the results showed that the differences in yield due to treatments of irrigation and depths of furrows were significant at 1% level. In irrigation treatments there was practically no difference in yield with 21" and 27" of water but both were significantly superior to the yield obtained with 15" of water showing thereby that 21" was the optimum dose. The increase in yield due to 6" deep furrows was significantly greater at 1% level over that due to 4½" deep furrow and at 5% level over that due to 9" deep furrows. The 9" deep furrows had given significant increases in yield over that due to 4½" deep furrows at 5% level. The yield of tubers obtained with 80 lb. N/acre was greater than that obtained with 40 or 120 lb. N/acre. 6" deep furrows in combination with 21" of water or 80 lb. N/acre gave the optimum yield.

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### AN UNDESCRIBED SPECIES OF SYNCHYTRIUM ON AMPELOCISSUS LATIFOLIA

ON *Ampelocissus latifolia* Planch., a member of the Vitaceae, a *Synchytrium* species was collected from several places in Bihar, which on examination was found to be undescribed. On the leaves the infection appeared as tiny yellowish minute galls, which often were grouped together in close proximity and presented a scabby appearance. On stems the galls were minute and imparted a warty appearance to the infected regions.

Sections through the galls on leaves and stems indicated the presence of resting spores only and the prosorus and sporangia were absent. The galls were single with a large reddish-brown resting spore in each. The epidermal host cells surrounding the infected epidermal cell multiplied rapidly and produced a mass of hyperplastic tissue which surrounded the gall. Consequently in the sections through the gall, the resting spore was seen embedded in a small mound of hyaline cells. In old galls the resting spores dropped off leaving a large concavity in the centre.

Comparative studies indicated that it differs from other species of *Synchytrium* known on Vitaceae and related families.

*Synchytrium ampelocissi* Mishra sp. nov.

Inciting gall formation on leaves and stems; galls minute, golden yellow, often grouped together and presenting a scabby appearance, simple and distinct. Resting spores globose to subspherical, golden-brown, thick-walled with oil globules surrounded by a mound of thin-walled tissue, 2 to 3 layers at top and 2 to 4 layers on the sides, measuring 110.4 to 220.8 μ average 141.4 μ in diameter.

*Hab.* On leaves and stems of *Ampelocissus latifolia* Planch., Darbhanga, Bihar, 7-12-1952. leg. J. N. Mishra. Type deposited in Herb. Crypt. Ind. Orient., New Delhi.

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### EGG-YOLK FACTOR AS BUFFALO SEMEN DILUTOR

It has been shown that the fertilizing capacity or the motility of buffalo spermatozoa cannot



be retained on an average for more than 48-72 hours in either egg-yolk phosphate or citrate buffer dilutors, which have proved so useful and popular for *Bos taurus* and *Bos indicus* semen. This has been a limiting factor in the wider application of artificial insemination in buffalo.

Experiments recently started with the active principle<sup>1</sup> present in egg-yolk have given encouraging results. The active principle was isolated by first precipitating proteins in egg-yolk with the addition of 4 vols. of acetone and subsequent washing with acetone to remove the greater proportions of the lipids. The yellowish precipitate was dried *in vacuo* to remove acetone, then extracted with Sorensen's buffer system— $\text{Na}_2\text{HPO}_4 + \text{KH}_2\text{PO}_4$  (pH 7.4) and followed by filtration or centrifuging of the buffer extract to remove insoluble material.

Fifteen good quality ejaculates from eight different buffalo bulls, belonging to a breed indigenous to Uttar Pradesh, were preserved at 4°C. in the solution of the active principle in the ratio of 1:1. Samples taken from the same ejaculates and kept in egg-yolk phosphate buffer dilutors served as controls. In the majority of cases, two samples of each ejaculate were preserved in each dilutor. In the controls no sperm survived beyond 12 days while in the samples preserved in the active principle live sperm were present upto 21 days. Further, in the former, out of 14 ejaculates, 5 could not be used for artificial insemination after 24 hours, 8 after 96 hours and 1 after 144 hours (having motility rating less than +++); while in the latter, 5 could be used upto 192 hours, 1 upto 240 hours, 5 upto 288 hours and 1 upto 336 hours. Only in two samples kept in the active principle was no live sperm present after 96 hours. It was also observed that the trace of lipo-protein was essential to prevent spermatozoa from the temperature shocks.<sup>2</sup> These results show that the life of the buffalo sperm *in vitro* could be extended for periods upto 2 to 3 times through the use of only the active principle in egg-yolk instead of egg-yolk itself in the dilutor. Further work is in progress.

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Indian Veterinary Res. Inst., S. S. PRABHU.  
Izatnagar, P. BHATTACHARYA.  
March 10, 1953.

1. Mayer, D. T. and John, F. Lasley, *Jour. of Animal Science*, 1945, 4, 277. 2. Kampschmidt, R. F. and Mayer, D. T., *Abs. Jour. of Animal Science*, 1951, 10, 1077.

### 'CREEPING' A MUTANT IN *CAJANUS* CAJAN MILLSP.

DURING the course of botanical improvement work on tur at the Agricultural Research Station, Niphad (Nasik), two unusual plants having abnormal structure and distinctly different as compared to the normal tur plants, were observed in the F-3 progeny of a cross between T. 74 and T. 43. These plants arose spontaneously and are breeding true for the last six years.

The normal tur plants grow erect, giving lateral, erect branching of indefinite or racemose type. None of the branches in normal tur plants is prostrate.



Newly observed plants have a weak stem as well as branches and hence put forth all its lateral branches close to the ground which results in a prostrate habit of growth. Because of the peculiar growth habit associated with this character, they have been named *Creeping*.

The creeping character had not been observed in either of the parental lines. Creeping plants are indistinguishable from the normal plants up to the time that the stem begins to elongate rapidly. Under ordinary field conditions the plants are about 1½' in height and 1½ to 2 months age at this time. As the stem and branches elongate, they lack sufficient strength to hold the plant erect and branches spread flat on the ground.

The prostrate habit is likely to be found useful as a cover crop and would help in soil conservation in the dry regions and in strip cropping.

The detailed genetical behaviour of these plants are under study and will be published later. Histology of stem of these plants is also being studied.

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