# SALVINIA AURICULATA *AUBLET*

## A RECENTLY INTRODUCED, FREE-FLOATING WATER-WEED,

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**SUMMARY**

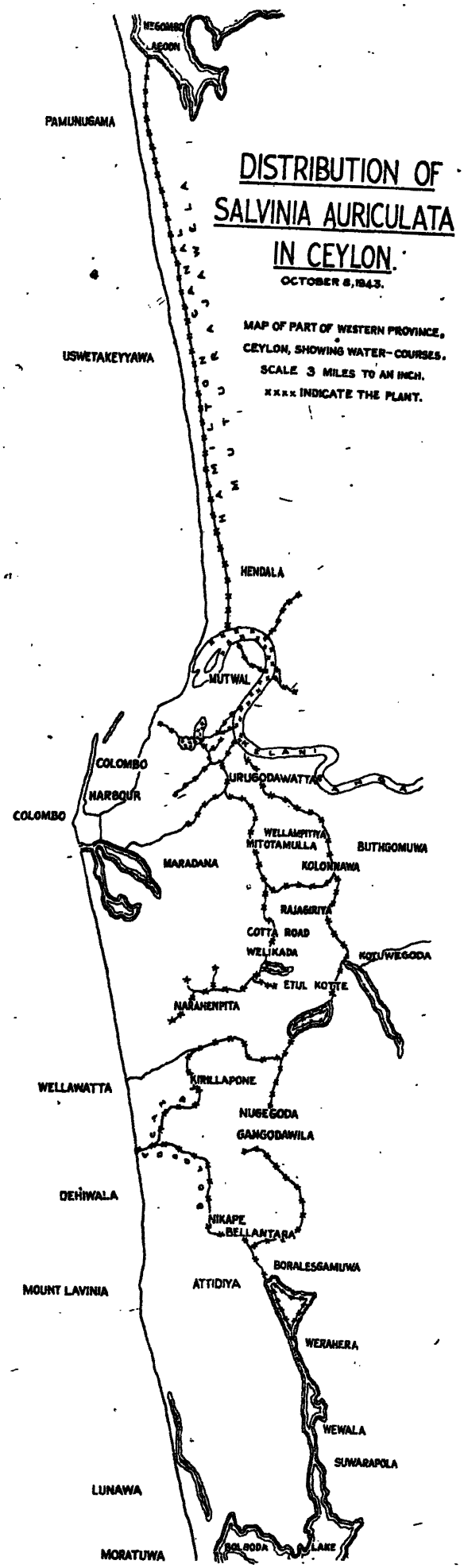
After an introduction in which are briefly mentioned how and where the Central American water weed *Salvinia auriculata* Aubl. was found in a naturalized state in Ceylon, and which has now assumed pest proportions in Colombo, are given a description of the plant and its methods of reproduction and dispersal. Its possible danger in silting up water-courses and in obstructing machinery is pointed out and methods of control are indicated.

**INTRODUCTION**

THE danger of indiscriminate introduction of new plants to Ceylon, intentionally or otherwise, has often been stressed in this Journal as these may turn out to be significant as weeds. A weed introduced to a new land is not in equilibrium with its environment: its natural competitors may be absent, and if soil, climate and other conditions prove suitable, in the absence of its natural checking influences, the weed may spread to such an extent as to overrun its newly-found home.

*Salvinia auriculata* Aubl. is a native of Tropical America. It is a free-floating water fern of great interest from a botanical point of view. It is also an attractive little plant of much ornamental value. It appears to have been introduced to Ceylon quite recently. It had not been recorded anywhere in Ceylon in a naturalized state until early in August, 1943, when Dr. W. R. C. Paul, Agricultural Officer, South Western Division, brought it to the notice of the writer.

On 24th August it was found in an *ela* (small water channel) bordering the Muturajavela experimental paddy fields at Usvetakeyyava. There were only a few plants scattered far apart. In a distance of about 50 yards of channel there were only six plants. These plants were small, with stems about two inches long and with only the smaller and more horizontal type of aerial leaf associated with young plants. The cultivators of the fields nearby had not noticed the plant there before, and apparently it was the first introduction of the weed to the

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*ela.* In the Negombo Canal, a few hundred yards away, the plant was found sparsely scattered near either bank where the flow of water was slow and the water more or less stagnant. Here a bridge was under construction and logs lying across the water had, acting as a barrier, held up about 25 plants. These, too, were small plants similar to the ones already noticed in the *ela.* On inquiry from the workmen and local residents it was ascertained that the plant had not been noticed by them earlier than about a month previously, and that it had been brought down from the Colombo side of the canal. Towards Colombo, along the canal, the weed was found to be of more and more frequent occurrence. It was also observed on some side *elas* along the route to Colombo.

On the same day, August 24, 1943, the Stanley Power Station at Kolonnava was visited, at the request of Dr. Paul, and there round the intake channel was an area of about 1,000 square feet entirely covered by the weed, whereas, it was said that on the previous day the whole area had been cleared of the plant. Numerous plants were seen floating downstream, steadily adding to the number. On inquiry it was learnt that the plant had not been noticed here more than four months previously and that it had assumed pest proportions only very recently. The plants here were mostly large, eight to twelve inches long, much branched, and bearing the bigger, almost vertically upfolded leaves characteristic of the adult plant, in addition to the smaller, horizontal leaves on the smaller branches. These smaller branches readily break off to form independent plants.

*Distribution.*—It would appear from a survey recently made (map) that the weed is at present confined to the Western Province where it occurs from as far south as Werahera in the Bolgoda area and extends along the waterways as far north as the Negombo Lagoon ; it is consequently found in all the areas in the vicinity of the network of waterways connected with this system of canals extending from Bolgoda to Negombo.

## DESCRIPTION

*Salvinia auriculata* Aublet, Hist. Pl. Guian. *2*.969, t. 367 (1775). (Family : Salviniaceae).

*Synonyms : Salvinia rotundifolia* Willd. (1810) ; *S. hispida* H.B.K. (1815) ; *S. biloba* Raddi (1825) ; *S. affinis* Desv. (1827).

*Origin.*—Tropical America.

*Habit.*—Although a fern, it is most unfernlike in appearance. It somewhat resembles *Pistia Stratiotes* L., *diya-parandel* (Sinhalese), though the differences are at once obvious. (Pl. I, 1, 2).

*Description.*—a gregarious, free-floating, perennial herb with no true roots; *stems* up to 12 inches long, much-branched, slender, floating, green, sparsely covered with brown hairs; *leaves* of two kinds: (1) *aerial leaves* or float leaves exposed to the air, firm in texture, green in colour, in addition to carrying on the usual functions of the leaf, helping the plant to float, sessile, with a peculiar canoe-form, being folded about the midrib so that the two halves are spread almost vertically (centre part of Pl. I, 1) though more open in weak light; leaf 1 to $1\frac{1}{4}$ inches long, $1\frac{1}{2}$ to $1\frac{3}{4}$ inches broad, deeply cordate at base, obtuse at apex, green, with a thick, keel-like midrib giving off 8 to 10 veins on either side; upper surface of the leaf densely covered with numerous, stalked, tuftedly-branched, whitish hairs longer towards the centre and preventing the leaf from wetting; lower surface thinly covered with short, brown hairs; (2) *water-leaves* much divided to form tufts hanging down in the water, greatly resembling true roots (Pl. I, 1); at each node two aerial leaves and a water leaf arise; in the branches which readily break off to form new plants, the leaves are smaller and more horizontally spread out and deep green to deep olive green in colour (Pl. I, 2, and left and right ends of plant in Pl. I, 1); *sporocarps* (which contain the reproductory structures or spores) are borne in clusters of 4 to over 50, arising from the base of the water leaves (Pl. I, 3).

## PROPAGATION AND DISPERSAL

The plant multiplies both vegetatively and by spores.

*Vegetative Reproduction.*—The plant gives off numerous offsets or branches which readily break away from the parent and start as new individuals. The stem, too, may break up to form separate plants. Vegetative reproduction is so prolific that in a few months, large stretches of water can be entirely covered by the weed. In water-courses the plants are carried by water to new localities. To some extent the plants are blown by the wind from one part of a stretch of water to another and so dispersed.

The rise and ebb of tide and the periodical floods are important causal factors in its distribution.

*Reproduction by Spores.*—Reproduction also takes place by spores. A single plant bears both male and female spores. Sporocarps were observed on the plants from August to November, and they probably occur also at other times of the year. It is likely that reproduction by spores is also a very prolific form of multiplication.

Since vegetative reproduction is so prolific and in addition the very abundant spores formed indicate that reproduction in this manner is also appreciable, the total rate of reproduction can be very great.

## ECONOMIC SIGNIFICANCE

A full discussion of the economic importance of the weed would be rather premature at the present stage as its spread is of such recent occurrence that it is difficult to predict whether it will attain the status of a major pest. Already it has become a serious nuisance at the Stanley Power Station by blocking the water inlet for cooling machinery, and it may obviously become objectionable in similar circumstances elsewhere. There is also the *a priori* possibility that the tufts of submerged leaves hanging down in the water may collect silt, which would otherwise flow away with the water, and cause it to be deposited on the bed of the water-course.

## CONTROL

It is too early to detail the best methods of control. Various possibilities are under trial. There is no physical difficulty in collecting the weed from the water and heaping it on dry land to decompose. Poles or planks held across waterways, along the surface of the water at suitable intervals will hold back the weed and it can thus be collected easily from time to time. Boats can also be used, particularly in still water, and with nets, baskets or similar contrivances the weed can be collected. The decomposed mass of vegetation may be useful as an organic manure.