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VEGETATIVE REPRODUCTION IN DIFFERENT FERNS AS OBSERVED IN FIELD

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ABSTRACT

The present study throws light on the different types of vegetative reproduction observed in ferns in the field area of Dehradun district, Uttarakhand where water fern azolla, vegetatively reproduces by fragmentation of the oldest branch, while it bears sex gametophytes as seed plants. Some of the common mode of propagation ferns is budding and rooting. The rootstock tufts in *Nephrolepis auriculata* (L.) Trimen when separated give rise to new plant. Similarly budding another method of reproduction is also observed in different fern species such as *Asplenium yunnaense* Franch. it occurs either by pinnule or as well as on apices of rachis, in Ampelopteris proliferation is noticed by axillary buds at the base of pinna pairs while in *Woodwardia biserrata* C. Presl where fronds emerge from mature and produce 1-3 plantlets along the central stipe, which can root down into the soil and many more. Proliferating bulbils can be found in Asplenium, Diplazium, Polystichum, Ampelopteris etc
KEYWORDS: Seed plants, Fragmentation, Rooting, Budding

INTRODUCTION

Ferns are one of the oldest known plants, and may be distributed all the way from the tropics to high rocky mountain slopes also in aquatic condition too. Some of the species are very small and delicate, while others are of the heights of trees. “True fern” is observed on the ground as a fiddlehead with the expanded fronds. Since the main plant body is sporophyte thus, they reproduce via spores which is common method of reproduction. The other mode of reproduction observed in the field was vegetative method which is distinctive i.e produce new plants from vegetative parts of the main plant that may take place by budding, Rhizome etc. The interesting vegetative mode were recorded in the field are the part of the paper.

MATERIAL AND METHODS

Comprehensive field survey of the district was carried during 2008-2011and the different phenomena which are interesting in the field was marked by visiting the areas frequently during different seasons especially rainy season i.e from July-October. Observed process were also clicked of the ferns in natural habitat,

RESULT AND DISCUSSION

Water Ferns.

The oldest lateral branch at the base of the stem is fragmented and gives rise to an independent plant in vegetative reproduction. Water ferns are unique as they have different sex gametophytes like seed plants, which may prove as evidence for the evolution of seed plants. The two pictures show leaves that have trichomes, or hairs on the leaves that helps water off of the leaves so that the fern doesn’t get droop down by rain water.

FIG.1

FIG.2

(Source: https://u.osu.edu/eeob3320/category/ferns/)

Budding and rooting

Ferns have different common reproductive adaptations. - A common method of vegetative reproduction which involves the vegetative parts of a plant including the roots, stems or leaves.

The phenomena of rooting, where root stock and root tuber in tufts are separated and plant is raised observed in *Nephrolepis auriculata* (L.) Trimen (IMG 4). The plant to extent spread quickly and can sprout from hairy tubers give out along its creeping stem. The plants which produce bunch of stems at ground level all indivual having its own root system are raised from ground and divided into individuals. This is called division. In case of separation, the rooted or unrooted parts usually get separated themselves on maturity and start or develop as a new individual in next season. Rhizomes, tubers, stolons, etc., are some other plant parts which are used for such purposes, a type of rooting. Proliferating bulbils can be observed in Asplenium, Diplazium, Polystichum, Ampelopsis etc. *Adiantum philippense* L. produced from offsets that form where the fronds touch the ground. (IMG 5)

Budding is another common method of vegetative reproduction. The process is reported in different fern species such as budding in case of Adiantum takes place through rachis, whereas in species of Asplenium such as *Asplenium trichomanes* L. subsp. quadrivalens D. E. Meyer (IMG 2), *Asplenium yunnaense* Franch. it occurs either by pinnule or as well as on apices of rachis, in Ampelopteris (IMG-1) propagation is observed by axillary buds at the base of pinna pairs. Similar type of budding is observed in *Diplazium esculentum* (Retz.) Sw., *Athyrium schimperi* Moug.ex Fee', *Adiantum edgeworthii* Hook., *Adiantum incisium* Forssk. The Phenomena is also noticed in Polystichum species which includes *Polystichum lentum* (D. Don) T. Moore and also in *Woodwardia biserrata* C. Presl (IMG 3) where fronds unfold from mature and produce 1-3 plantlets along the central stipe, which can produce root into the soil. Apart from natural budding it can be done in laboratory by joining two pieces of living plant tissue in such a way that it allows the parts to join and subsequently grow and grow as a single plant.

IMG 1

IMG 2

IMG 3

IMG 4

IMG 5

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