

MORPHOLOGICAL NATURE OF THE OVULIFEROUS

SCALE OF CONIFERS

Dr. M. Roy

PAPER-III

(e-content Prepared on 17/07/2020)

TDC Part-II(H)

(2019-20)

Group-A

Introduction:

The morphological nature of the ovuliferous scale of Conifers has remained a debated subject from the early phases of the study of this group of gymnosperms. Different workers have proposed divergent views on the basis of their studies and interpretations. The more prominent ideas given on the subject may be summarized as below:

1. Brown (1827) interpreted ovules as pistils and ovuliferous scale as open carpel. But his proposition that a carpel (leaf) produced in the axil of a bract (leaf) met strong opposition.

2. Schleiden (1839) stated that ovuliferous scale is a placenta, which is a flattened axis. This branch nature was later on supported by Bailion, Dickson, Strasburger and others, but without regarding as placenta.

3. Braun (1842) from his studies on the cone of Larix represented ovuliferous scale as the first two leaves of the axillary shoot, which were fused by their adaxial margins. This view was accepted by Oersted, Von Mohl and others.

4. Dickson (1860) observed in some cones of Picea excelsa that lower bracts and the ovuliferous scales are the axes of the next higher order. Similar cones have been reported by Shaw from Sequoia and by Goebel from Pinus. These illustrations support the sporophyll character of a bract, which is a carpel.

5. Parlatore (1864) recorded in a cone of Pinus pinaster that at the axil of every

... Contd. p. 2

: 2;
alternate bract, dwarf shoot bearing two needles
leaves sprang and, therefore, he supported
Braun's view.

6. Oersted (1864) in some cones
found that lower bracts were foliate in
nature bearing a number of scales as on
a suppressed axis, the two outermost
being the largest and opposite; higher
up, the bracts becoming smaller and
smaller and the axillary scales becoming
less numerous, but the two outermost
scales gradually increased in size and
became connate by their adaxial margins
bearing rudimentary ovules at the base
and in the uppermost part, the bracts
were reduced to their normal form, the
scales enlarged and fused into a single
structure.

He, therefore, supports the axis
nature of the ovuliferous scales as
proposed by Braun (1842).

7. Sachs and Eichler (1868) supported
that the ovuliferous scale is a ligular
outgrowth of the bract, which is a carpel
as in the leaves of Selaginella, Isoetes,
etc.

8. Van Tieghem (1869) from his study
of vascular anatomy of the bract and
ovuliferous scale stated that the vascular
supply of these organs starts separately
from the axes and are, therefore, inde-
pendent in origin. The bundles from the
base of the scale undergo inversion and
then divide into an arch of bundles.
This supports the axis nature of the
scale and the inverse circulation shows
... Contd. p. 3

: 3 :

that a leaf belongs upon the suppressed branch opposite the branch.

9. Stenzel (1876) supported Braun's view from his study of abnormalities in the cones of Picea excelsa.

10. Celakovsky (1879) confirmed the axis nature of the ovuliferous scale which shows the blended characters of the integuments of the ovule. There is, therefore, no carpel present.

11. Kaubart suggested that the ovuliferous scale is an arch on the basis of his studies of Junipers.

12. Bessey (1892) tried to establish that ovuliferous scale is a continuation of the chalaza and that the staminate and ovulate strobili are homologous. Of all the views presented above, Braun's opinion regarding the axis nature of the ovuliferous scale appears to be most convincing and valid as it reasonably relates megasporangia to the abaxial surface of the sporophylls, the relation held by the microsporangia.

— X —