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**STELLATE HAIRS AND PELTATE SCALES OF OHIO PLANTS.**

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All hairs and scales serving merely as a covering, without reference as to their origin, have practically one function, that of protection. They serve as a protection in two ways; first, by preventing evaporation by the wind, and second, by preventing the direct rays of the sun from shining on the surface of the leaf and thus causing excessive transpiration and injury to the chlorophyll. With this function in mind it is easily seen how much more effective the interlaced points of stellate hairs or scales would be, than simple short hairs.

There are two divisions of stellate pubescence; first, that in which the leaf is covered with hairs having a star shaped or many-pointed top and a single stalk by which they are attached to the surface of the leaf, and second, that in which the leaf is covered with simple hairs arranged in tufts from one point. The illustration given of a stellate hair of *Lepargyrea canadensis* (Fig. 3) shows plainly the many-pointed top and the single stalk. The stellate hairs of *Croton monanthogynus* (Fig. 7) and of the *Solanums* (Figs. 17, 18, 19) do not have the long stalks on the under side by which they are attached to the surface of the leaf, but instead they are almost sessile. They have, however, a single point or branch which rises from the center and stands at right angles to the remainder of the hair and to the surface of the

leaf. On the hairs of *Solanum carolinense* there are usually four spreading points and a single erect one, but the number of points on the other *Solanums*, the *Crotons* and on *Lepargyrea* vary greatly. On these plants we find the more typical forms of true stellate hairs.

The second type of stellate pubescence is shown in the figures of *Hicoria minima* (Figs. 11, 12) *Helianthemum canadense* (Figs. 22, 23) and *Viburnum alnifolium* (Figs. 25, 26). In these the single hairs are arranged from a common point on the surface and spread in many directions. Hairs arranged in this manner are called stellate tufts.

The hairs of *Hicoria minima* are rather heavy, and there are very seldom more than four in the tuft. A great many of the tufts have only two hairs. The single hairs of the *Helianthemum* are barbed and a little more slender than those of the hickory. The number of hairs in a tuft varies but tufts made up of from six to fifteen are the most common. The single hairs of *Viburnum alnifolium* are very long and slender, and being very much twisted and intertwined give a true tomentose covering to the leaf. The number of hairs in a tuft varies, but most frequently there are from ten to twenty.

The *Lepargyrea* has peltate scales along with the stellate hairs. In fact the transition is very gradual, and there are some intermediate forms which could be placed either with the scales or the hairs. Usually though they fall into three rather distinct divisions: the brown scale (Fig. 1), the white scale (Fig. 2), and the white stellate hair (Fig. 3). The stellate hairs of *Hicoria minima* and other species are also found associated with scales (Figs. 8, 9, 10), but the scales are entirely different from those of *Lepargyrea*. There is also a sharp distinction between the hairs and the scales of the hickory, no transition forms being present. The scales of *Hicoria minima* are rather large, yellowish green or brown in color and attached to the leaf by a very short stalk. Those of *Hicoria alba* are smaller and brown in color, and those of *Chamaedaphne calyculata* are also of the same type. They are of a typical peltate shape and are multicellular.

#### OHIO PLANTS WHICH HAVE STELLATE PUBESCENCE.

*Juglans cinerea* L., leaves stellate tufted.

*Hicoria ovata* (Mill.) Britt., twigs stellate tufted, leaves finely stellate tufted.

*Hicoria laciniosa* (Mx.f.) Sarg., leaves stellate tufted.

*Hicoria glabra* (Mill.) Britt., leaves stellate tufted, only slightly above.

*Hicoria alba* (L.) Britt., twigs stellate tufted, leaves tomentose-stellate tufted.

*Quercus nana* (Marsh.) Sarg., leaves stellate tufted above when young.

*Quercus marylandica* Muench., leaves stellate tufted above when young.

*Quercus minor* (Marsh.) Sarg., leaves stellate tufted above.

*Quercus prinoides* Willd., young leaves sparingly stellate tufted above; mature leaves stellate tufted beneath.

*Polygonum arifolium* L., leaves stellate tufted beneath.

*Bursa bursa-pastoris* (L.) Britt., leaves stellate tufted.

*Camelina sativa* (L.) Crantz, leaves stellate tufted.

*Camelina microcarpa* Andrz., leaves stellate tufted.

*Draba verna* L., twigs and leaves stellate tufted.

*Draba caroliniana* Walt., twigs and leaves stellate tufted.

*Stenophragma thaliana* (L.) Celak., twigs and leaves stellate tufted.

*Alyssum alyssoides* (L.) Gouan., twigs and leaves densely covered with stellate hairs.

*Hamamelis virginiana* L., leaves stellate tufted.

*Croton capitatus* Mx., twigs and both sides of leaves densely covered with stellate hairs.

*Croton monanthogynus* Mx., twigs and both sides of leaves densely covered with stellate hairs.

*Althaea rosea* Cav., leaves densely stellate tufted.

*Malva rotundifolia* L., leaves stellate tufted beneath.

*Malva moschata* L., leaves stellate tufted beneath.

*Callirrhoe involucrata* (T. and G.) Gr., twigs and leaves stellate tufted.

*Napaea dioica* L., twigs and leaves stellate tufted.

*Abutilon abutilon* (L.) Rusby, leaves densely stellate tufted.

*Hibiscus moscheutos* L., twigs stellate tufted, leaves stellate tufted, more dense beneath.

*Helianthemum majus* (L.) B. S. P., leaves stellate tufted above.

*Helianthemum canadense* (L.) Mx., leaves stellate tufted above and below.

*Lepargyrea canadensis* (L.) Greene., leaves covered with stellate hairs, sparingly above, but densely beneath.

*Solanum carolinense* L., twigs and leaves covered with stellate hairs.

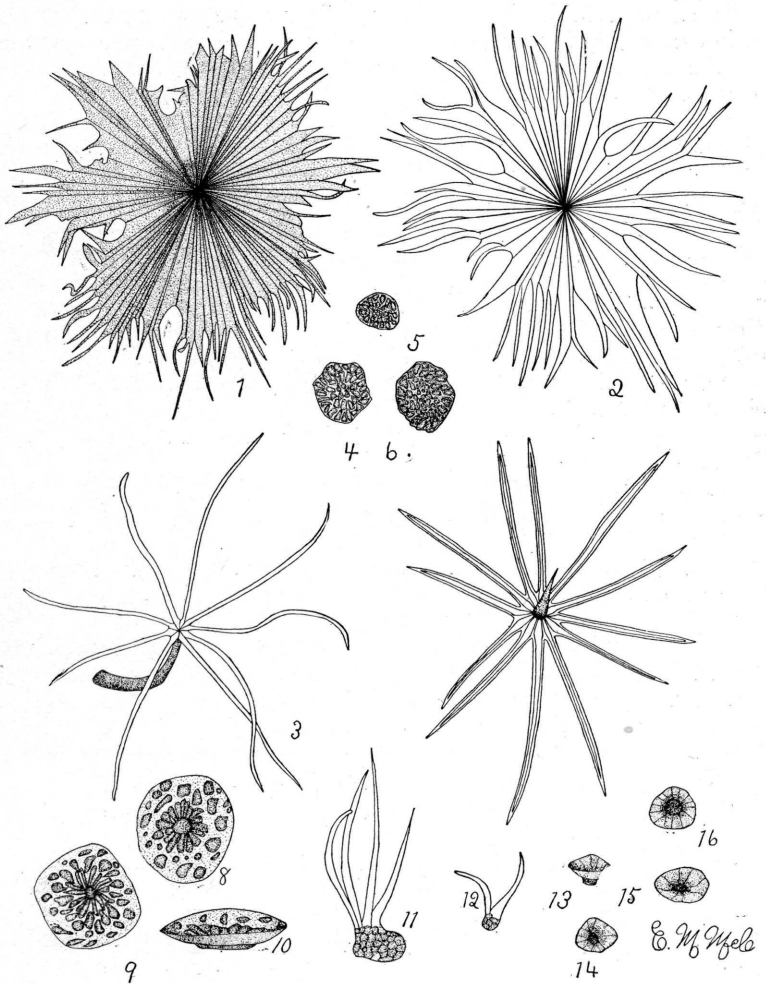
*Solanum elaeagnifolium* Cav., twigs and leaves covered with fine stellate hairs.

*Solanum rostratum* Dunal, twigs and leaves covered with stellate hairs.

*Verbascum thapsus* L., twigs and leaves densely covered with branched and stellate hairs.

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Plate V.

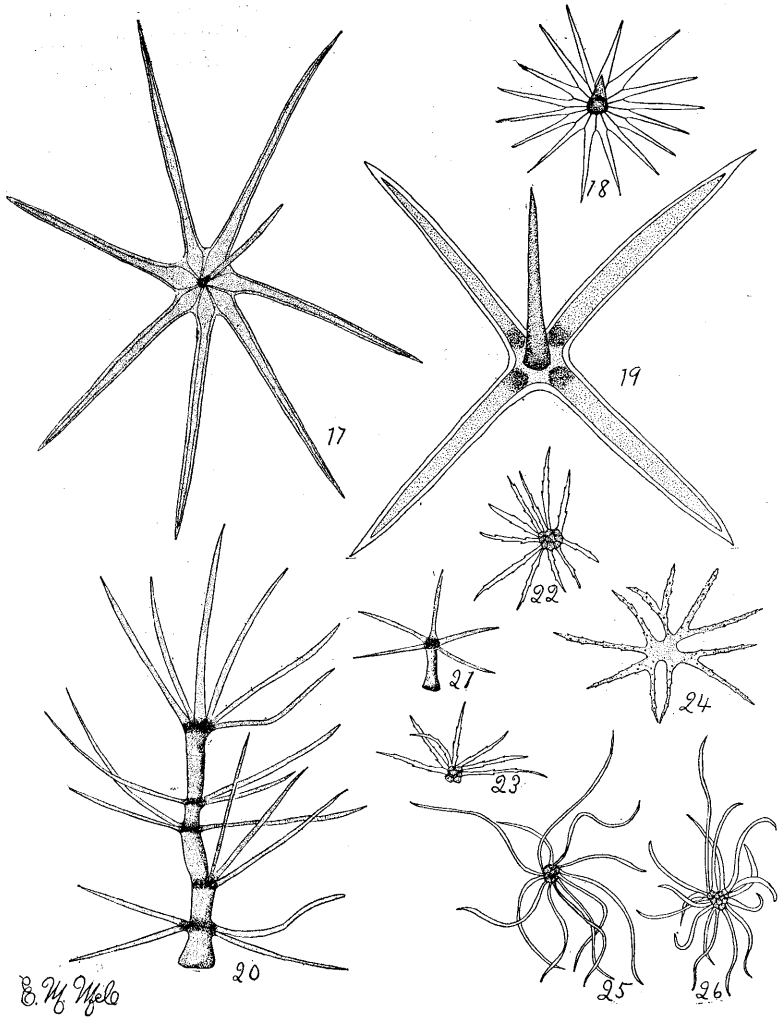


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MCCLERY on "Stellate Hairs and Peltate Scales."

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*Plate VI.*



MCCLEERY on "Stellate Hairs and Peltate Scales."

- Viburnum alnifolium* Marsh., twigs and leaves stellate tufted; more dense on twigs and on veins on under side of leaves.  
*Viburnum acerifolium* L., leaves stellate tufted beneath.  
*Viburnum pubescens* Ph., leaves stellate tufted beneath.  
*Viburnum molle* Mx., leaves stellate tufted beneath.  
*Viburnum lantana* L., twigs and leaves densely stellate tufted; leaves more dense beneath.

## OHIO PLANTS WHICH HAVE PELTATE SCALES.

- Hicoria minima* (Marsh.) Britt.  
*Hicoria ovata* (Mill.) Britt.  
*Hicoria laciniosa* (Mx. f.) Sarg.  
*Hicoria alba* (L.) Britt.  
*Hicoria microcarpa* (Nutt.) Britt.  
*Hicoria glabra* (Mill.) Britt.  
*Lepargyrea canadensis* (L.) Greene.  
*Chamaedaphne calyculata* (L.) Moench.

This list does not include plants having scales which are glandular or whose function is mainly the excretion of resinous material.

## EXPLANATION OF PLATES V. AND VI.

- FIGS. 1, 2. Peltate scales of *Lepargyrea canadensis*.  
 FIG. 3. Stellate hair of *Lepargyrea canadensis*.  
 FIGS. 4, 5, 6. Peltate scales of *Chamaedaphne calyculata*.  
 FIG. 7. Stellate hair of *Croton monanthogynus*.  
 FIGS. 8, 9. Peltate scales of *Hicoria minima*; top view.  
 FIG. 10. Peltate scale of *Hicoria minima*; side view showing stalk.  
 FIGS. 11, 12. Stellate tufts of *Hicoria minima*.  
 FIG. 13. Peltate scale of *Hicoria alba*; side view showing stalk.  
 FIGS. 14, 15, 16. Peltate scales of *Hicoria alba*.  
 FIG. 17. Stellate hairs of *Solanum rostratum*.  
 FIG. 18. Stellate hair of *Solanum elaeagnifolium*.  
 FIG. 19. Stellate hair of *Solanum carolinense*.  
 FIG. 20. Branched hair of *Verbascum thapsus*.  
 FIG. 21. Stellate hair of *Verbascum thapsus*.  
 FIGS. 22, 23. Stellate tufts of *Helianthemum canadense*.  
 FIG. 24. Dichotomously branched stellate hair of *Alyssum alyssoides*.  
 FIGS. 25, 26. Stellate tufts of *Viburnum alnifolium*.