SOME NOTES ON MARTYNIA.

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During the summers of 1904 and '05, I made a series of observations on some plants of Martynia proboscidea, and a few notes may not be without interest. The seeds sprout very slowly, whether wintered in the ground or indoors. Some sown in April and early May did not come up until the middle of June and the first part of July. It seems that the seeds require a rather high temperature. In fairly rich soil the plants grow to a diameter of from four to six feet, while on poor soil and in the shade they remain quite small.

The leaves, at first opposite, gradually become more and more scattered on branches of the second, third, etc., orders. They are decidedly dimorphous; those standing above and below on the branches are typically symmetrical and comparatively wider, while those at the sides are narrower and asymmetrical, especially at the base, the proximal part being longer than the distal and more or less incurved.

The plants are decidedly heliotropic. While still quite young and only a few inches high, they are inclined towards the East in the morning and towards the West in the evening. When they grow larger, the leaves take a conspicuous part in the movements. Those standing towards the East and West raise and lower their blades, while those directed North and South turn on their petioles. It was especially noted that even on cloudy mornings, at dawn, when the eye could hardly distinguish a difference of light between East and West, the plants were decidedly inclined towards the East.

All parts of the plant, except the inner surface of the deeper part of the corolla tube and of the calyx, are densely beset with glandular hairs containing a viscid fluid on which hundreds of small insects are caught. It is a question as to whether they are assimilated as food.

Frost kills the plants and they soon decay or become dry. But the immature fruits remain green and fresh for one to several weeks if protected from severe frosts. There is no doubt that the thick fleshy husk has an important part to play in the ripening of the seed.

The most interesting variations occur in the flower. Normally the calyx is split down to the pedicel or nearly so, on the inferior side, with five lobes, the upper, median lobe being the longest. The corolla, large and showy on strong plants, 50–65 mm. long and of about the same diameter, has normally five lobes, two upper ones which are the equivalent of an upper lip, one on each side, and one lower which is broader than the others

and of somewhat different shape. Along the inferior side of the corolla tube and extending into the inferior lobe is a group of usually five orange colored stripes, which I call the "lyra." The stamens are four, in two pairs, arranged so that the four large anthers are contiguous in two pairs and adjacent to the upper arch of the corolla. There is also an upper median, short stamen-vestige, usually somewhat bent to the right or left. These well known details are given for a better understanding of the variations noted below:

1. Small, more or less abortive, flowers appear late in Sept. and Oct.; but it is remarkable that such were from the first on the same spike with and among large, perfect flowers, without intermediate forms. Later with cooler weather and slow growth they became numerous. The corolla was only 20–30 mm. long and the lobes, always of the normal number, were quite small and not at all or little spread out. The colors were paler than in the large flowers. The stamens were nearly straight or irregularly curved, isolated and not joining above and the anthers were small, pale, more or less abortive, yet usually bearing some pollen. The vestigial stamen was always present and the calyx of the usual shape but comparatively somewhat larger than the corolla. At least part of the flowers were fructescent, as the ovularies grew so far as the weather permitted. The bumble bees are regular visitors of the flowers and the latter may have been pollinated from the large perfect flowers.

2. In some cases there is only one upper lobe of the corolla and not a trace of the stamen vestige; otherwise corolla, stamens, and calyx are normal. Over a dozen such flowers were seen on a few plants during 1905.

3. One flower, observed Aug. 31, 1905, was very abnormal. There were four corolla lobes, apparently an upper, lower, and two lateral, yet the whole upper part of the corolla appeared to be wanting. The lower part had the usual "lyra" and the right and left sides and lobes each with faint lyra markings. There were four stamens spreading and curving about irregularly with the anthers arranged T-shape on the filaments rather than lengthwise. There was no trace of an upper stamen vestige. The calyx was divided irregularly into two parts down to the pedicel, a smaller portion consisting of one lobe on the right, upper side and a larger one with three somewhat rudimentary lobes. The fruit resulting from this flower is also abnormal; the pod is straight, of the same formation above and below; the projecting crest on the upper side is wanting; both halves of the beak are curved to the left.

4. In some otherwise normal flowers, the upper stamen vestige grows to one-third and even to fully the length of the other stamens, and has a more or less well developed anther sometimes even with some pollen.

5. Flowers having the corolla of the usual size with two lateral lobes on the right or left side and three stamens on the same side. Either the upper or the intermediate stamen seems to be the additional one of the three. In a flower with two corolla lobes and three stamens on the right side, the intermediate one was evidently additional, being only half as long as the others and with a rudimentary anther. In all of these flowers the usual upper stamen vestige was present and the calyx normal. In the descriptions "right and left" refer to the flower and not to the observer.

6. One flower, with two corolla lobes and three stamens on the right side, had the left lobe distinctly but not deeply incised in the middle and there was no trace of a third stamen.

7. One flower of good size had two lateral corolla lobes and three stamens on the left side and one lobe with two stamens on the right. The upper lobes were separated by only a slight but distinct incision and the stamen vestige was wanting. The calyx was closed below and had an additional lower median lobe.

8. A flower with two lateral lobes and three stamens on each side. In this case the stamen vestige was present and the calyx normal.

9. A type of flower with the lower lobe of the corolla double, and two well formed "lyras". One additional, median stamen was developed below. This sometimes curved upward to join the cluster of the other anthers, or in some flowers it was directed nearly straight forward. The upper vestige was present and the calyx was closed below and contained a sixth median, inferior lobe. In 1904 two such flowers were seen and in 1905 at least one developed a normal two-parted fruit.

10. One flower with the same peculiarities as those mentioned under 8, but the left lower lobe and the left lyra were not fully developed. The lower, median stamen filament was adnate to the corolla its entire length, as also the lower half of the anther, but the other half was standing out free.

11. One flower with two lower lobes and two "lyras"; two lateral lobes on the left side and one on the right; with stamens to correspond, three on the left and two on the right and one inferior, median stamen. The calyx was entire and had an additional, inferior, median lobe as in No. 8.

12. One flower of normal size with two inferior lobes and two "lyras." The lateral lobes were present but were separated from the inferior lobe by incisions less distinct than usual. There were three stamens, the upper pair and one inferior median stamen longer than the two others. There was no trace of the inferior pair but the vestigial stamen appeared as usual, and the calyx was the same as in No. 8.

In all the normal and abnormal flowers the style was of the same form except that it was smaller in the defective flowers mentioned in No. 1. All the abnormal flowers were found on large strong plants, while the flowers on smaller plants growing in poorer soil were all normal, although numerous and of fair size,

Martynia seems to be a plant peculiarly adapted for studies in variation and peculiar forms of flowers, and it would be very desirable to have some person take up the subject further.

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