

covered with minute, cup-shaped depressions, into which open the perforations of the tube. Distance from tentacle to eye but twice length of tentacle, which equals one-fourth diameter of orbit.

Caudal fin equal to length of caudal peduncle. Dorsal large, the base equaling three-sevenths height of fin.

Body without fleshy slips or folds.

Head $3\frac{1}{2}$ in length; eye about one-fourth head. D. 9 or 10; A. 10.

Color in spirits: Dark brown above, white below; entire upper parts including caudal fin, covered with round, white spots, most numerous on caudal peduncle, the largest much less than half pupil; a round black area surrounding base of pectorals, bounded by a white line; several parallel longitudinal black streaks below the pectorals; orbit with two concentric white rings.

Known from six specimens collected by Professor Bradley at Panama. The type is numbered 29679 on the register of the National Museum.

The following species are here for the first time recorded from Panama:

1. *Ginglymostoma cirratum*.
2. *Urolophus halleri*.
3. *Syrrhina exasperata*.
4. *Stolephorus miarchus*.
5. *Ophisurus xysturus*.
6. *Ophichthys zophochir*.
7. *Sidera verrilli* sp. nov.
8. *Serranus calopteryx*.
9. *Pomadasys brevipinnis*.
10. *Gobiesox adustus*.
11. *Emblemaria nivipes* sp. nov.
12. *Salarias rubropunctatus*.
13. *Dactyloscopus* sp. nov. (?)
11. *Tetrodon angusticeps*.
15. *Arothron erethizon* sp. nov.

INDIANA UNIVERSITY, *December 1, 1882.*

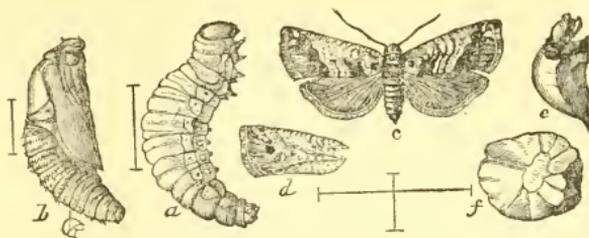
JUMPING SEEDS AND GALLS.*

By CHARLES V. RILEY.

Having recently received some fresh specimens of so-called "Mexican Jumping Seeds," or "Devil's Beans," as they are popularly called, I take occasion while yet they are active to exhibit them to the society. It will be noticed that these seeds are somewhat triangular, or of the shape of convolvulus seeds, there being two flat sides meeting at an obtuse angle, and a convex one, which has a median carina. They not only

*Read before the Biological Society of Washington November 24, 1882.

roll from one side to another, but actually move by jerks and jumps, and will, when very active, jump at least a line from any object they



CARPOCAPSA SALTITANS: *a*, larva; *b*, pupa; *c*, imago—enlarged, hair-lines showing nat. size; *d*, front wing of a pale var.; *e*, seed, nat. size, with empty pupa skin; *f*, do. showing hole of exit.—(After Ri'ey.)

may be resting on. The actual jumping power has been doubted by some writers, but I have often witnessed it. To the uninitiated these movements of a hard seed seem little less than miraculous. They are induced by a plump, whitish, lepidopterous larva which occupies about one-fifth of the interior, the occupied seed being, in fact, but a hollow shell, with an inner lining of silk which the larva has spun. The larva looks very much like the common apple-worm (*Carpocapsa pomonella*), and belongs, in fact, to the same genus. It resembles it further in remaining for a long time in the full-grown larva state before transforming, so that the seeds will keep up their motion throughout most of the winter months. When about to transform, which is usually in the months of January and February, it cuts a neat, circular door in the convex side of its house, strengthens the same with silk, spins a loose tube of silk within the seed, and therein transforms to the pupa state. The moth soon afterward pushes its way out from the little door prepared for it.

The moth was first described in 1857 as *Carpocapsa saltitans* by Prof. J. O. Westwood,* and afterward as *Carpocapsa dehaissiana* by Mons. H. Lucas.†

In regard to the plant on which these seeds occur there is much yet to learn, and I quote what Mr. G. W. Barnes, president of the San Diego Society of Natural History, wrote me in 1874 concerning it, in the hope that some of the botanists present may recognize it:

“ARROW-WEED (*Yerba de flecha*).—This is the name the shrub bears that produces the triangular seeds that during six or eight months have a continual jumping movement. The shrub is small, from 4 to 6 feet in height, branchy, and in the months of June and July yields the seeds, a pod containing three to five seeds. These seeds have each a little worm inside. The leaf of the plant is very similar to that of the ga-

* Proc. Ashmolean Soc. of Oxford, 1857, t. 3, pp. 137-8; see also Trans. Lond. Ent. Soc., ser. 2, 1858, t. IV, p. 27, and Gard. Chron. 1859, Nov. 12, p. 909.

† “Note sur les grains d'une Euphorbiacée de Mexique sautant au dessus du sol par les vibrations d'une larve de l'ordre des lepidoptères vivant en dedans.”—(Ann. Soc. Ent de France, ser. 3, t. 6, Bull. p. 10, p. 33, p. 41, p. 44, 1859; t. 7, p. 561-566.)

rambullo, the only difference being in the size, this being a little larger. It is half an inch in length and a quarter of an inch in width, a little more or less. The bark of the shrub is ash-colored, and the leaf is perfectly green during all the seasons. By merely stirring coffee, or any drink, with a small branch of it, it acts as an active cathartic. Taken in large doses it is an active poison, speedily causing death unless counteracted by an antidote."

In a recent letter he states that he is informed that the region of Mamos, in Sonora, is the only place where the plant grows; that the tree is about four feet high and is a species of laurel, with the leaves of a dark varnished green. "It bears the seeds only once in two years. The tree is called *Brincador* (jumper), and the seeds are called *Brincaderos*. The seeds are more quiet in fair weather, and lively on the approach of a storm."

Professor Westwood mentions the fact that the plant is known by the Mexicans as "*Colliguaja*;" and Prof. E. P. Cox, formerly State geologist of Indiana, now living on the Pacific coast, informs me that the shrub has a wood something like hazel or whahoo; that the leaf is like a broad and short willow leaf. He confirms the statement as to its poisonous character; that a stick of the shrub, when used by the natives to stir their "penola" (ground corn-meal, parched), purges, and that the shrub is used to poison arrowheads. The plant is undoubtedly Euphorbiaceous.

The peculiarity about this insect is that it is the only one of its order, so far as we know, which possesses this habit, and it is not easy to conceive of what benefit this habit can be other than the possible protection afforded by working the seed, after it falls to the ground, into sheltered situations.

The true explanation of the movements of the larva by which the seed is made to jump was first given by me in the Transactions of the Saint Louis Academy of Science for December 6, 1875 (Vol. III, p. exci).

The jumping power exhibited in this "seed" is, however, trifling compared with that possessed in a little gall which I also exhibit. This gall, about the size of a mustard seed, and looking very much like a miniature acorn, is found in large numbers on the under side of the leaves of various oaks of the White Oak group, and has been reported from Ohio, Indiana, Missouri, and California. It falls from a cavity on the under side of the leaves, very much as an acorn falls from its cup, and is sometimes so abundant that the ground beneath an infested tree is literally covered. It is produced by a little black Cynips, which was described as *Cynips saltatorius* by Mr. Henry Edwards. The bounding motion is doubtless caused by the larva which lies curved within the gall, and very much on the same principle that the common cheese-skipper (*Piophilæ casei*) is known to spring or skip. Dr. W. H. Mussey, of Cincinnati, in a communication to the Natural History Society of that city, December, 1875, states, in fact, that such is the

case; though members of the California Academy who have written on the subject assert that the motion is made by the pupa, which I think very improbable. At all events the bounding motion is great, as the little gall may be thrown 2 or 3 inches from the earth; and there are few things more curious than to witness, as I have done, a large number of these tiny galls in constant motion under a tree. They cause a noise upon the fallen leaves that may be likened to the pattering of rain.

NOTE ON CLUSTER FLIES.

By W. H. DALL.

Having heard several years ago of a fly which was a great nuisance in the country houses near Geneva, N. Y., among members of my wife's family living there, I requested information and specimens when it should be convenient. Some time since a relative visited Geneva, and on his return brought me some of these flies alive in a bottle covered with gauze, which were exhibited at the last meeting of the Biological Society and turned over to Prof. C. V. Riley for identification. Since then a letter has been received, from which I make the following extracts:

"It is probably thirty years since the flies appeared in our neighborhood. I remember little about it except that they were at once a terror to all neat housekeepers, and from their peculiar habits a constant surprise. People soon learned to look for them everywhere; in beds, in pillow slips, under table covers, behind pictures, in wardrobes nestled in bonnets and hats, under the edge of carpets, and in all possible and impossible places. A window casing solidly nailed on will, when removed, show a solid line of them from top to bottom; they are uncanny. They like new houses, but are often found swarming in old unused buildings and go regularly to church, or perhaps only a few good ones abide in sanctuaries; any way they are there. Best of all they like a clean dark chamber seldom used, and if not disturbed form in large clusters about the ceilings. With them are usually found a number of purplish black hornets and some ladybugs (*Coccinella*). They are very cold and feel in the hand like small bits of ice. They are very oily; if crushed, leave on the floor a great grease-spot. I hardly think they breed in the houses, but do not know. About the 1st of April or as soon as the sun shines warm in the early spring they come out in the grass and fly up to the sunny side of the houses. Some possibly creep in open windows, or if the house is closed and sealed they have a faculty of going through any crack. They remain until some time in May, then disappear, and no more are seen until about September, when they come and remain as long as they are allowed to. They are very strong. A powder that suffocates common house flies has very little effect on them, and we attack them with ammonia and drown them with boiling water; even then are not sure they are 'kilt entirely.' Very few are found in the towns or villages; they live in country places altogether.