MEXICAN JUMPING BEAN.

The Determination of the Plant.

By C. V. Riley.

In the Transactions of the St. Louis Academy of Science for December, 1875, Vol. III, page CXLI, I gave some account of *Carpocapsa saltitans* Westwood, and the manner in which it produces the motions of the well-known Mexican Jumping Seed or "Devil's Bean," and I there called attention to the fact that the particular Euphorbiaceous plant, upon which these seeds occur, was not known or determined. The poisonous nature of the plant, and the fact that it is used by the Indians to poison their arrow-points, have long been known, and, in fact, the plant is called Arrow Weed (*Yerba de flécha*) by the Mexicans. The shrub was described to me in a letter from Mr. G. W. Barnes, then President of the San Diego Soc. Nat. Hist., in 1874, as small, branchy, from four to five feet in height, bearing in the months of June and July seeds, a pod containing from three to five. The leaf was described by Mr. Barnes as resembling that of Garambullo, being one-half inch in length and one-quarter inch in width, a little more or less. He described the bark as ash-colored and the leaf as perfectly green during all seasons, and stated that it bore seed only once in two years. In a later letter he stated that, according to his information, it grew only in the region of Mamos in Sonora; that it is called Brincador (Jumper), and the seeds "Brincaderos." Westwood, in his original description of *Carpocapsa saltitans*, states that the plant is known by the Mexicans as *Colliguaja*, and my old friend, Prof. E. P. Cox, informed me some years ago that the shrub has a wood something like the Hazel or Wahoo, and that the leaf is like a broad and short willow leaf. He confirmed the statements as to its poisonous character and its use to poison the arrow-heads of the Indians, and said that a stick of the shrub, when used to stir the "Penola" of the natives (ground corn meal parched), purges. I have taken every occasion possible during the last fourteen or fifteen years to endeavor to get specimens of this particular plant, with the view of having it accurately determined, and I was very much gratified, therefore, in receiving last November from M. P. Chrétien, a member of the French Entomological Society, an interesting communication in which, in asking for copies of my articles upon this insect, he referred to his own rearing of it, and to the plant as a Mexican Euphorbiaceous plant by the name of *Colliguaja odorifera* Moline, which is a synonym of *Croton colliguaja* Sprengel. This letter

was still on my desk when Mr. J. M. Rose, of the Botanical Division, brought me specimens of plants which had recently been collected by Dr. Edw. Palmer, who, with the plants, sent specimens of the capsules, thus rendering it quite certain that the "Jumping Bean" occurs on this particular plant. It turns out to be undescribed, and has been finally referred to the genus *Sebastiania*, and Mr. Rose intends to describe it as *S. palmeri*. Naturally, as in so many Euphorbiaceous seeds, the carpel splits into two parts in dehiscing, but when infested with the Carpocapsa larva the silk lining which the latter spins prevents the seed from dehiscing. The general aspect of the leaf is not unlike that of a broad-leafed willow, the length varying from one to three inches, and the width from about one-half to one and one-quarter inches. The reference given by M. Chrétien in his letter would appear to be erroneous. At all events, Bentham and Hooker give *Colliguaja odorifera* as from South America, and I can find no record of its occurring in Mexico. Comparison of the specimens in the Department herbarium shows that, while evidently allied, *Colliguaja* is quite distinct from *Sebastiania*, which fact renders it rather remarkable that the name given by the Mexicans to the plant should be identical with that adopted for the genus of a South American plant, and the inference may properly be drawn that this name is applied by the inhabitants indifferently to various Euphorbiaceous species which occur, whether in Mexico or south of the Equator.

If *Colliguaja* does occur in Mexico and is also a host of *Carpocapsa saltitans*, it may readily be distinguished from the species of *Sebastiania* here mentioned by its small, thickish leaves, which are strongly glandular-toothed; the male flowers form long slender spikes, with very many stamens. The capsule is described as nearly one inch broad.

A closely allied species of *Sebastiania*, coming from the same localities, and also yet undescribed (but which Mr. Watson intends to describe as *Sebastiania pringlei*) and which has previously been referred to the genus *Gymnanthes*, also shows evidence of being infested with Carpocapsa, and indeed an esteemed correspondent, M. Eugène Dugès, of Guanajuato, Mexico, has reared the moth from the capsules of this particular species. Still a third species (*S. bilocularis* Watson) is interesting because the capsules are bi-coccous instead of tri-coccous, and the capsule is withal much smaller and more rounded.

It is also infested by a larva which, if not the same, is closely allied to that of *Carpocapsa saltitans*. A single moth was obtained by Mr. Rose, but was lost, so that I have not been able to examine it. So far as its general appearance is concerned,

however, Mr. Rose thinks it showed close resemblance, although smaller, to that produced from the seeds of *S. palmeri.*

There is, therefore, good evidence that the insect develops in the capsules of several different species of the genus *Sebastiania*, if not in those of other closely-allied genera. The plants differ not only in the general appearance and foliage, but in the inflorescence and seed, and the following synopsis, prepared for me by Mr. Rose, will prove interesting:

SEBASTIANIA.—A large genus of Euphorbiaceæ, of some forty species, confined mostly to South America; mostly shrubs; rarely herbs; leaves alternate, entire or slightly toothed; flowers monœcious; the male flowers forming slender terminal spikes at the base of which are 2 or 3 female flowers; female flowers with small bract-like calyx, 3 to 5-parted; fruit a capsule, globular or 3-lobed; the capsule separates in age into 3 cocci each of which contains one small seed which more or less fills the cavity.

Sebastiania bilocularis Watson.—(Proc. Amer. Acad. XX, 374, 1885). A shrub 1 to 2 feet high with upright slender branches, glabrous and with light-gray bark; leaves linear-oblong or narrowly lanceolate, 1 to 2 inches long, obtuse to acuminate, abruptly cuneate at base, obscurely glandular toothed; ovary two-celled, with two stout revolute stigmas; capsule broadly ovate, acute, bi-coccous, about 5 lines long; seed sub-globose, 3 lines broad.

It grows in dry water courses on the hills and mountains of Northwestern Sonora, and has been reported from Lower California.

Sebastiania palmeri Rose n. sp. ined.—A loose-growing shrub, 5 to 8 feet high, or even sometimes 10 feet high, glabrous, with reddish bark; leaves narrowly-lanceolate to lanceolate, 2½ to 4 inches long, slightly dentate; ovary 3-celled, with 3 spreading slightly united styles; capsule oval, obtuse, 3-celled, 3 lines in diameter.

Collected in various places in the mountains about Alamos, Sonora, by Dr. Palmer in 1890.

Sebastiania pringlei Watson n. sp. ined.—A small shrub with spreading branches and brownish bark; leaves lanceolate 1 to 3 inches long, acuminate, obtuse at base, minutely toothed; ovary 3-celled, with spreading slightly united styles.

Collected by Pringle in San Luis Potosi, and in Sonora by Dugès in 1890.

It is difficult to say which of the species Mr. Barnes referred to in his letter from which I have already quoted, but the reference to the seed is somewhat misleading, and the reference to the pod containing from three to five seeds is also somewhat ambiguous and probably erroneous. Each of the carpels contains one seed, which, when the fruit is young in all probability fills up the entire space and the young Carpocapsa larva doubtless hatches from an egg laid externally on the capsule and penetrates the same while it is yet quite young, eating into the true seed very much as in the case of the larva of the common Pea Weevil (*Bruchus pisi.*) The plant described by Prof. Cox, whom I have quoted, corresponds fairly well with *S. pringlei.* Dr. Palmer found that *S. palmeri*

was limited in its distribution to certain cañons about Alamos. He states that it is known as the *Palo de la flécha*, *cuero de las simellas*, *brincaderos*, (Arrow tree which produces the jumping bean). The plant exudes a good deal of milky juice, which is what the Indians use on their arrow heads. He found the plant in several places, but it is reported that the "jumping beans" are found only in an *arroya* near Alamos. It is not easy to obtain the infested capsules, because boys are always on the lookout for them and gather them for sale, as they find a ready market. He describes the shrub as a loose-growing plant, five to eight feet high, the wood very hard, and the milky juice readily crystallizing into a clear white brittle substance.

Professor Riley also called the attention of the Society to some interesting anomalies in the following species. They are two Noctuids, both from the same locality and both from a rather small collection recently received, which show a shortening of the wings on one side (the left) of the body. The species are *Agrotis placida* Grote and *Agrotis introferens* Grote. In neither of these species is there anything to show that this is due to gynandromorphism, as they are both females, with no indication of male character on one side. The deformity or aberration is undoubtedly due to chance.

The other case is more interesting. It is a remarkable bifurcation of the terminal joint of the left antenna in a specimen of the common Cerambycid *Tragidion armatum*. The bifurcation is from the base of the joint, and in fact, the abnormal growth has all the appearance of a thumb growing out from the base of the terminal joint, the thumb being somewhat longer than the joint itself.

Mr. Schwarz remarked in answer to an inquiry by Mr. Mann that bifurcation of the antenna was not infrequent in Coleoptera and may be of a single joint only, as in the specimens exhibited, or of the entire antenna.

Mr. Schwarz presented the following paper: