

thirty days; it should be undertaken in September or October, when it is said that the root lice will be drowned, and the vines come out uninjured.

Bisulphide of carbon is claimed by some to be an efficient remedy; it is introduced into the soil by means of an augur with a hollow shank, into which this liquid is poured; several holes are made about each vine, and two or three ounces of the liquid poured into each hole. Being extremely offensive in odor and very volatile, its vapour penetrates the soil in every direction, and is said to kill the lice without injuring the vines. This substance should be handled with caution, as its vapour is very inflammable and explosive. Carbolic acid mixed with water, in the proportion of one part of acid to fifty or one hundred parts of water, has also been used with advantage, poured into two or three holes made around the base of each vine with an iron bar to the depth of a foot or more. Soot is also recommended, to be strewed around the vines.

It is stated that the insect is less injurious to vines grown on sandy soil; also to those grown on lands impregnated with salt.

Since large numbers of these insects, both winged and wingless, are known to crawl over the surface of the ground in August and September, it has been suggested to sprinkle the ground about the vines at this period with quicklime, ashes, sulphur, salt or other substances destructive to insect life. The application of fertilizers rich in potash and ammonia have been found useful, such as ashes mixed with stable manure or sal-ammoniac.

A simple remedy for the gall-inhabiting type is to pluck the leaves as soon as they show signs of the galls, and destroy them.

Several species of predaceous insects prey on this louse. A black species of Thrips with white fringed wings deposits its eggs within the gall, which, when hatched, produce larvæ of a blood red colour, which play sad havoc among the lice. The larva of a Syrphus fly, *Pipiza radicum*, which feeds on the root louse of the apple, see figure 79, has also been found attacking the Phylloxera. Another useful friend is a small mite, *Tyroglyphus phylloxera*, P. & R., see (Fig. 80), which attacks and destroys the lice, and

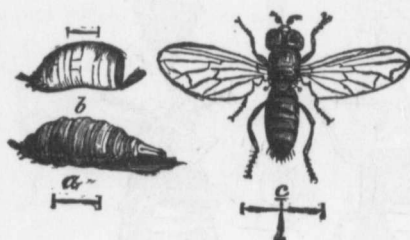


Fig. 79.

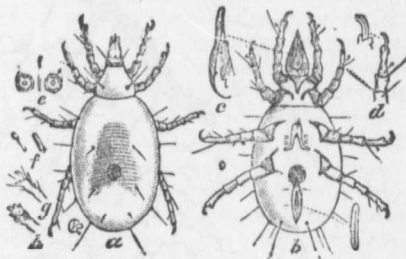


Fig. 80.

associated with this is sometimes found another species, *Holophora arcata*, Riley, of a very curious form, reminding one of a mussel. In (Fig. 81), this minute friend is represented highly magnified in the different forms assumed by it.

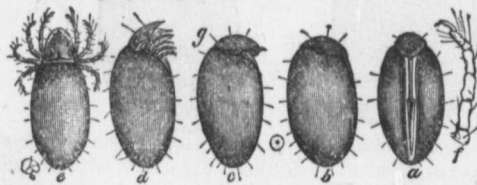


Fig. 81.

are found upon them, these latter may be destroyed by immersing the roots in hot soap suds or tobacco water.

Our native American vines are found to withstand the attacks of this insect much better than do those of European origin, hence by grafting the more susceptible varieties

on these hardier so teracted. The root bement, Cunningham one of the varieties ing type of Phyllox and the vine is so v ible effects.

This is another be a troublesome in been injurious to g duction to America has been called to i it is said to have de

During the pas there being very fev young larvæ have show a discoloured is opened and the examined there wil in the pulp a small and thin, and of a w. Besides feeding on times eats portions the contents of a si sufficient, two, three together as shown fastened with a pa with castings, when from one to the them and devourin tents. At this pe about an eighth of blackish shield cover green. As it appoi of an inch long is fu dish tinge and a few feet blackish, pro-leg

When the larvæ cutting out for this enclosure which it li of the edge of the le The chrysalis is about colour, from which t

The perfect inse are spread nearly fou with a slight metalli ornamented with dar in colour towards the of this insect during autumn when the gra

REMEDIES—As chrysalis state attach of the insects would This insect is attacke the enemy in subjecti