

USE OF THE SURFACTANT, DECON 90, IN THE PREPARATION OF COCCIDS AND OTHER INSECTS FOR MICROSCOPY

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Abstract

The surfactant, Decon 90, is useful for the preparation of hardened, dry specimens of coccids for microscopy and may be useful in biological operations requiring reflation of shrivelled specimens (dry Thysanoptera) or removal of wax and other secretions.

Many species of Coccoidea are covered with wax, present as a scale, a felted covering, a solid resin or as a filamentous exudate. This wax is often difficult to remove completely by maceration in potassium hydroxide solution, the process generally used as the initial stage in the preparation of mounts for taxonomic study (see Kozarzhevskaya, 1968) and as a result may interfere with subsequent staining and obscure details which are necessary for identification of the insect. Additionally, the results of preparation of mounts of coccids that have been stored as a dry collection have been very variable. The heavily waxed, dry specimen, presenting a combination of these problems, may be easily and consistently prepared to a high standard using the alkaline surfactant, Decon 90‡, in the process given below.

The species used to test the procedure are given in Table I together with some of the properties that render them difficult to prepare. Mature adults of *Drosicha townsendi* Cockerell (Margarodidae) are about 1 cm in length and have a hardened dorsal surface which is difficult to soften by direct potassium hydroxide maceration, prolonged treatment removing some important taxonomic characters. However, soaking in cold Decon 90 renders this so pliable that after removal of the body contents and maceration, the whole insect can be mounted flat without cracking of either the ventral or dorsal surface. *Aonidiella aurantii* (Maskell) is easily freed from its adhering scale in the surfactant while specimens of *Laccifer lacca* (Kerr) can be efficiently extracted from stick lac by standing overnight in a 1:1 mixture of Decon 90 and 5% potassium hydroxide solution. The alkali is necessary to keep the pH of the solution high and neutralise the resin acids in the shellac which would otherwise prevent the surface active action.

TABLE I
INSECTS MOUNTED FOR LIGHT MICROSCOPY WITH THE AID OF DECON 90

Species	Problem
<i>Kermes quercus</i> (L.)	Heavily sclerotised
<i>Drosicha townsendi</i> Cockerell	Large waxed insect
<i>Laccifer lacca</i> (Kerr)	Heavily resin-encrusted
<i>Aonidiella aurantii</i> (Maskell)	Adheres to scale
<i>Newsteadia floccosa</i> (de Geer)	Wax-covered
<i>Icerya seychellarum</i> (Westwood)	Wax-covered
<i>Hemaspido proctus</i> sp.	Large, wax-covered

PROCEDURE

(1) Soak specimens overnight in Decon 90. Add excess 5% KOH solution if large quantities of resins are present.

(2) Heat in boiling water bath, agitating occasionally if necessary until wax and other adhering matter is freed (1-5 min).

‡Produced by Decon Laboratories Ltd., Ellen St., Portslade, Brighton, U.K.

(3) Rinse ($2\times$) with distilled water. Specimens that have become shrivelled by drying or storage in alcohol of too high a strength become reinflated on soaking for about 2 hr in cold distilled water at this stage.

(4) Puncture specimen and heat in Decon 90 on a boiling water bath (5 min). Large and dark specimens should be macerated in 5% KOH until translucent.

(5) Express body contents.

(6) Rinse well in distilled water.

(7) Arrange specimen as needed for slide and harden by rinsing with 1% acetic acid in ethanol.

(8) Fix, stain and mount as desired.

Stage (1) is necessary only for fragile and dry specimens. Maceration in potash solution is not always required (Stage 4). Excellent mounts of small and delicate specimens e.g. young *A. aurantii*, *Newsteadia floccosa* (de Geer) 1st instar larvae of *D. townsendi* and *Icerya seychellarum* (Westwood) can be made by maceration in Decon 90 only but care must be taken to remove the body contents and rinse thoroughly, otherwise troublesome granulations sometimes can be seen in phase-contrast investigation. Excessive evaporation of Decon 90 in use should be avoided as the solution becomes opaque and a precipitate may form. This usually dissolves again on dilution with distilled water, but more refractory deposits may be renewed by soaking in 1% acetic acid in water.

Surface active compounds such as Decon 90 show promise in other related fields of preparation of insects for microscopy. For instance, Thysanoptera that have become dry and shrivelled or contracted by storage in alcohol of too high a concentration may be easily reflat. The specimens are soaked in Decon 90 for about 16 hrs at room temperature, subsequently rinsed thoroughly with distilled water and then immersed in distilled water until fully expanded (about 2 hours). The wings and wing pigmentation are not adversely affected by this procedure but crumpled wings become expanded and flat. Decon 90 also assists the removal of wing scales from Lepidoptera and of adult aleyrodids from their pupal cases and will probably be a useful tool in any procedure that requires softening of hardened cuticle, removal of wax and other secretions, and in biological cleaning operations where mildness of action is essential.

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REFERENCE

KOZARZHEVSKAYA, E. F. (1968).—Methods of preparing slides for coccid (Homoptera, Coccoidea) determination. *Ent. Obozr.* 47: 248-253.



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