

BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

(Not to be reproduced without the permission of BIS or used as an Indian Standard)

भारतीय मानक मसौदा

एपिस मेलिफ़ेरा के लिए पराग जाल - विशिष्टि

Draft Indian Standard

POLLEN TRAP FOR *APIS MELLIFERA* — SPECIFICATION

ICS 65.140

FAD 03 - Apiary Industry Sectional Committee

Last date of comments: 21 November 2023

FOREWORD

(Formal clause will be added later)

Pollen is a very rich source of proteins, fats, mineral, vitamins and also carbohydrates. Honey bees gather pollen grains advertently or inadvertently while foraging the blooms of various bee floral plants. During the visits of the bees on the blooms, the pollen grains from the anthers of the flowers get stuck to the bee body, which with the help of their middle legs, is shifted to the pollen basket (corbicula) on the outer side of the tibiae of their hind legs and is compressed in the form of a pollen pellet. The forager on its return to its hive dislodges the pollen pellet with the help of spine on the distal end of the tibia of the middle leg into comb cell. The in-house bees compress it further in the cell and add a little honey and salivary secretions to prevent its spoilage. The pollen later transformed into bee bread is consumed by nurse bees and the feeding on this food results in growth and development of the bees and results in increased brood rearing. This results in faster growth of the colonies and thereby ensures higher colony productivity.

Because of high nutritional value of the pollen, it is in high demand in several countries where it is used for health and therapeutic reasons. Thus, this is another hive product which if collected by beekeepers, can increase their apiary income through the sale of this product. Pollen traps of various designs are being used in several countries as separable attachment with Langstroth hives having *Apis mellifera* Linnaeus colonies for collecting bee corbicular pollen before it is taken inside the colony, as an additional hive product. Corbicular pollen collected using the pollen trap, during the period of ample availability of pollen rewarding bee flora, can be sold in the market for augmenting the apiary income or can be used by the beekeepers for feeding to the colonies during the period of pollen dearth as such or supplementing into pollen substitute to transform it into pollen supplement for feeding to the honey bee colonies during pollen dearth period.

Pollen trap is a wooden structure with perforated plastic pollen load detaching screen, which is attached at the front of the brood chamber of Langstroth 10 bee-frame hive (Type C hive) after removing wooden gate block of the hive. The two wooden extension rods, one on each side of the trap, are inserted into the hive through the space created after removing the gate block.

This Indian Standard is developed in order to provide guidance to pollen trap manufacturers and other concerned stakeholders regarding various requirements of a good quality pollen trap. Conformance to this standard will ensure the improvement in quality of pollen traps as well help in retain the quality of pollen collected using the trap, which in turn will help beekeepers to gather additional income.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

This standard prescribes the material, design and dimensions requirements along with use of pollen trap for collecting corbicular pollen load from Italian race of western honey bee, *Apis mellifera* Linnaeus bees, entering their Langstroth hive i.e. Type C hive.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1141: 1993	Seasoning of timber – Code of practice (<i>second revision</i>)
1150: 2000	Trade names and abbreviated symbols for timber species (<i>third revision</i>)
1515 : 2013	Beehives – Specification (<i>fourth revision</i>)
2062 : 2011	Hot rolled medium and high tensile structural steel - Specification (<i>seventh revision</i>)

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Langstroth Hive

Type C hive as per IS 1515.

3.2 Western Honey Bee

Apis mellifera Linnaeus bee which is hived in Type C hive in India.

3.3 Pollen Trap Body

Woody structure of the pollen trap san pollen load detaching removable plastic screen and wooden pollen tray.

3.4 Extension Bars

Wooden bars with square cross-section, one on each side of the trap body.

3.5 Trap Roof

Wooden plank covering the pollen trap which has an extension in front in the form of eave for preventing rain showers entering into the pollen trap.

3.6 Pollen Load Detaching Screen

Perforated with round holes, removable plastic strip slid in the pollen trap in vertical position through a groove in trap roof and opposite facing grooves in the trap side planks/ walls.

3.7 Pollen Load

Single corbicular pollen pellet removed from either hind leg of worker honey bee.

3.8 Corbicula (pl. corbiculae)

Cuticular hairs forming a basket on the outer side of each distal part of hind tibia of worker honey bee.

3.9 Wire Mesh Cover

Wire mesh screen, over the pollen collecting tray, with square holes just larger than pollen loads through which the detached pollen loads fall into the pollen collecting tray lying underneath. This mesh prevents the bee's entry into the pollen collecting tray.

3.10 Pollen Load Collecting Tray

Wooden tray lying on trap floor under wire mesh cover in which the detached/dislodged pollen load is collected.

3.11 Trap Floor

Wooden plank fixed to the lower side of the rest of the pollen trap structure.

4 MATERIALS

4.1 Wood

For the purpose of pollen trap body and pollen load collecting tray, well-seasoned (*see* IS 1141:1993) *kail* (*Pinus wallichiana*) or pine (*Pinus* spp.) or teak (*see* IS 1150:2000) wood shall be used.

4.2 Plastic

For pollen load detaching screen, HDPE shall be used.

4.3 Wire Mesh

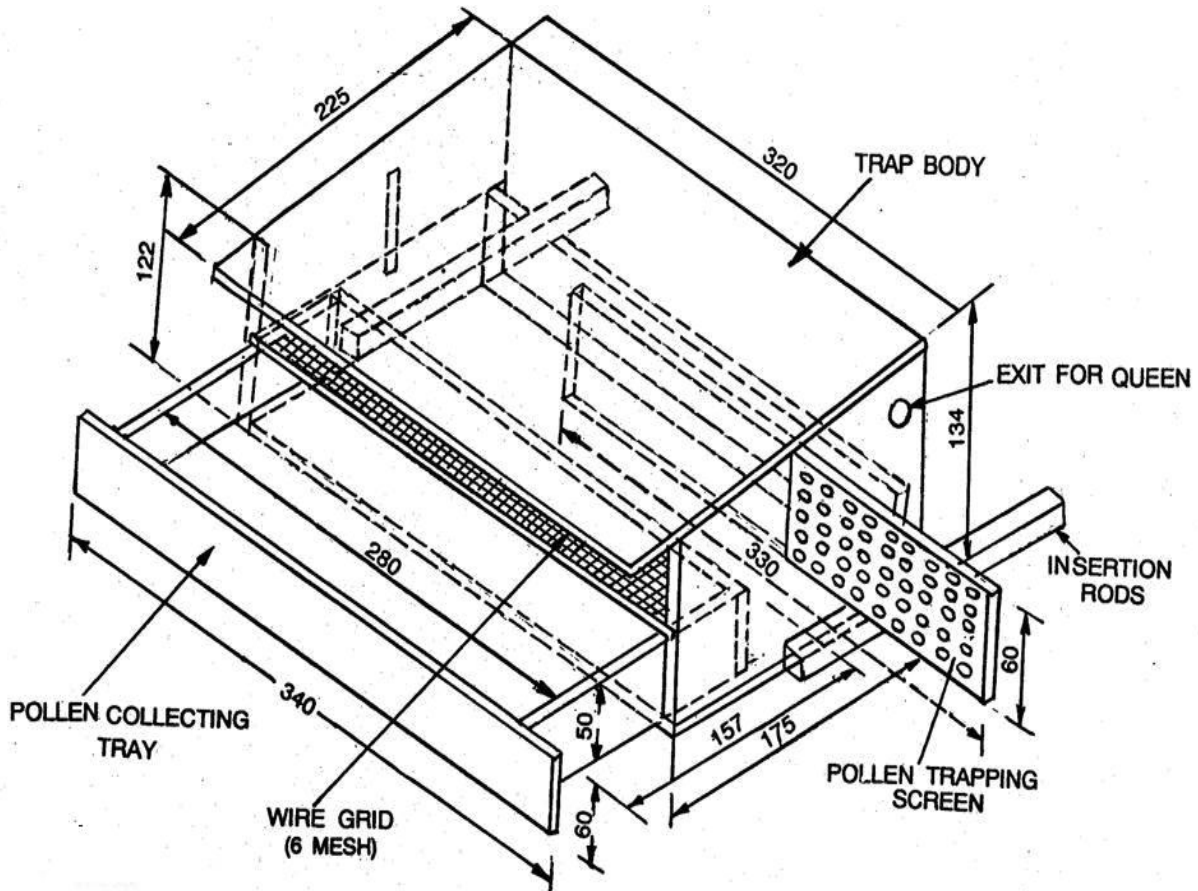
For wire mesh cover, mild steel wire (as per IS 2062) shall be used.

4.4 Aluminum

Aluminum strip shall be used for fixing on either side of wire mesh screen for facilitating easier entry into its place through a groove on inner width-wise side of either of the trap's side plank / wall of hive body.

5 CONSTRUCTIONAL REQUIREMENTS

The pollen trap (Fig. 1) shall consist of the following parts with the constitutional details as under:



All dimensions in millimeters.

FIG .1 TYPICAL POLLEN TRAP

5.1 Pollen Trap Body

Pollen trap body, which shall be made of *kail/pine/teak* wood, shall have all its planks with 9.5 mm thickness and bars with cross-section of 22.2 x 22.2 mm. The pollen trap body shall also consist of the following components conforming to the mentioned constructional details:

5.1.1 Trap Roof

The wooden plank shall be of 9.5 mm in thickness, 225 mm in width and 320 mm in length. It shall be so fitted to be a little inclined downwards from front. From the front edge by 207 mm, it shall have a shallow groove of 2 mm depth and 2 mm width on the inner side of its plank throughout its length for easier insertion and removal of pollen load detaching screen.

5.1.2 Trap Side Planks/ Walls

These shall be trapezoidal and 9.5 mm thickness. Its top edge should be of 225 mm in length and 134 mm in width at its posterior end and 122 mm in width at anterior end. Each side plank should have one 7 mm diameter hole 27 mm from posterior/ rear end and 87 mm from its bottom for facilitating exit and re-entry of queen bee during nuptial flight which shall remain plugged at other times with 7 mm thick wooden stick. Each side plank should have 2 mm deep and 2 mm wide groove on its inner side at a height of 50 mm from the upper surface of the trap floor. These grooves shall start from the anterior edge of the side plank and should extend to a length of 157 mm towards rear side. Leaving 157 mm from their anterior, there shall be 2 mm wide groove starting at 50 mm from the trap floor and extending up to trap roof. These grooves, one each in each of the side plank, shall be across the width of the plank, through which pollen load detaching screen shall pass.

5.1.3 *Trap Floor*

It shall be made of 9.5 mm thick wood and should be 175 mm in width and 320 mm in length.

5.1.4 *Extension Bars (Insertion Rods)*

These are two bars, one each fitted on outer side of the either of the trap side planks. These are fitted length-wise with the width of the pollen trap with its lower edge along the trap's bottom edge. These bars should have square cross-section of 22.2 x 22.2 mm and should be 175 mm in length. These are so fitted that their 96 mm length should extend beyond rear end of the trap. This extended part of the rods is used for attaching with the hive body by inserting these inside the hive through the space vacated by removing the wooden gate block of the hive.

5.1.5 *Pollen Load Collecting Tray*

It shall be made of 9.5 mm thick wooden planks or 1.5 mm thick HDPE sheet, the outer dimensions of which should be 280 mm (length) x 157 mm (width) x 50 mm (height). The front plank should extend by 30 mm on either side beyond the pollen trap width so that the front plank is 340 mm in length. The extended portion on either side is used for holding the trap for pulling/sliding it out for pollen collection.

5.2 Pollen Load Detaching Screen (Pollen Trapping Screen)

It shall be made of 1.5 mm HDPE sheet. This sheet shall have 5 rows of 4.7 mm diameter round holes to have 50 per cent pollen dislodging efficiency, each row with 28 holes. The plastic screen should be 330 mm long and 60 mm in width such that it extends by 5 mm on either side for facilitating holding it in fingers for its fixing or its removal. Its upper edge moves in a groove on the underside of the trap roof.

5.3 Wire Mesh Cover

It shall be 6 mesh size wire screen with its length and width just equal to that of pollen load collecting tray. Its length-wise edges and frontal width-wise edge shall be folded in 10 mm wide aluminum strip such that it is covered by 5 mm width of aluminum strip on its each side, the upper and the lower faces. This wire mesh shall be slid just over the pollen load collecting tray through its sides moving in 2 mm x 2 mm grooves on the inner side/ face of the trap's side planks.

6 INSTALLATIONS

For installing pollen trap on to the hive, the front wooden gate block/ rod shall be removed and the trap fixed to the hive by inserting the extended portion of the extension blocks of the trap into the hive through the space so created after removing the gate block. Pollen load detaching screen shall be kept a little displaced from its exactly right position such that it shall not pass through the groove of one of the two side planks of the trap. It shall be kept so for two days to make the bees adapted to this new attachment and find their entry into the hive without much disturbance to them. After the bees shall become used to this attachment, the plastic strip is slid such that it shall also pass through the groove in the other side plank. The pollen trap shall be kept in this position continuously for every two weeks and for another two weeks in former position of incomplete insertion of the plastic screen. In the former condition, bee passing through the strip only, shall fall their pollen load in the pollen load collecting tray which shall be collected on every alternate day and stored under air-tight condition. In the condition of incomplete insertion of the plastic screen, the bees shall pass through the open side of the screen into the hive and shall carry the pollen along which shall cater to the needs of the colony.

7 WORKMANSHIP AND FINISH

7.1 The different parts of the pollen trap shall have smooth finish with the edges trimmed square and smooth.

7.2 Parts of the trap exposed directly to the weather shall be painted white. The paint shall be non-toxic and shall not have any disagreeable odour.

7.3 All joints shall be sound and shall withstand normal use.

7.4 Wall shall be joined by special box corner joints or finger joints or dovetail joints or tongue and groove joints properly nailed. When the use of nails for joints is specified, there shall be one nail at each end.

8. PACKING AND MARKING

8.1 The pollen trap shall be supplied in the complete form, properly assembled or in separate parts as agreed to between the purchaser and the vendor. Unless otherwise specified, the pollen trap parts shall be packed according to trade practices in such a way as to protect them from damage in transit and during storage.

8.2 Marking

The following information shall be engraved on the trap:

- a) Name of the item;
- b) Trade-mark, if any;
- c) Batch or code number;
- d) Name of the manufacturer; and
- e) Date of manufacture.

8.3 BIS Certification Marking

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*,

2016 and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.