Supplementary Appendix 1. Rearing protocols.

Protocol for fast rearing *Callipogon relictus* on a fungal diet

Preparing the fungal diet

1. Prepare commercial potato dextrose agar powder as the medium for sub-culturing *Pleurotus florida*.
2. Mix potato dextrose agar agar powder in a 1-L graduated cylinder, at a ratio of 19.5 mg of powder in 500 mL water. Transfer the solution to a 1-L conical flask and mix with a magnetic stirrer on a heating plate.
3. When completely solubilised, divide the solution into 20 mL portions, which were poured into 50-mL, round-bottomed, glass test tubes.
4. Autoclave the glass test tubes at 121 °C for 20 minutes. at a vapour pressure of 1.2 kg/cm^2, and place it in a tilted position until solidified.
5. Prepare sawdust medium by crushing *Quercus* Linnaeus (Fagaceae) wood, which was maintained at 50–60% moisture content.
6. Tamp 1 kg of the moistened sawdust into each transparent polypropylene bottles (1.4 L), and make a 1-cm-diameter hole in the middle from the surface to the bottom of the bottle. Then cover the bottle with a sterilised cotton cap.
7. Autoclaved the sawdust medium for two hours at 121 °C.
8. After autoclaving, cool the sterilised sawdust to 25 °C, and transfer the sawdust mediums to an aseptic room.
9. Scoop potato dextrose agar medium into the bottles of sawdust and cultivate. Set the temperature of the cultivation room at 25 °C, maintain the humidity under 70%, and cultivate in the dark for 20 days.

10. Transfer the containers to 5 °C refrigerator and keep until ready to use.

Preparing ovipositing logs and mating cage

1. Prepare properly decayed wood of *Quercus mongolica* Fisch. ex Ledebour to be used for egg laying.
2. A piece of rotten *Quercus mongolica*; size preferred about 8–9 cm in diameter and 12–15 cm in length.
3. Each piece of rotten *Quercus mongolica* should be soaked in water for two hours until the moisture is absorbed throughout the wood.
4. Microwave for 30 minutes in order to eliminate eggs or larvae of ants or other predacious insects and pathogenic bacteria.
5. Put 4–5 rotten *Quercus mongolica* logs in a plastic box filled with *Quercus mongolica* sawdust.

Mating adults and obtaining eggs

1. Put one male and one female together in a plastic oviposition-cage with oak sawdust for 4–5 days.
2. The male and female should be at least 5–7days old after emergence.
3. After observing several matings, remove male from the cages and isolate.
4. Keep the females in the cages alone at room temperature (22–25 °C) until post-oviposition and death.

Collecting neonate larvae from logs and removing to containers

1. After 4 weeks post mating, calculated from the day the eggs hatched 3–4 weeks after

they are laid, open oviposition cage and separate logs from sawdust. Unchecked sawdust should not be discarded.

2. Split logs that were used for oviposition carefully by hand and collect neonate larvae with the use of larvae forceps.
3. Larvae must be carefully removed and transferred to the diet containers independently.
4. Make a hole that is 5 mm in diameter with a screw auger in the centre of the diet, and then drop a larva into the hole and cover up with a tiny amount of diet.
5. Use only one larva per diet container.
6. Transfer the containers to chambers under constant temperatures of 30 °C, at least 60% relative humidity (0:24 light:dark hour photoperiod).

Rearing larvae

1. Continue transferring larvae with fresh diet every four weeks for instars 1–3 , two weeks for instars 4–6, and one week for instars seven and higher respectively.
2. At any time, if the hardened fungal diet gets damaged due to movements of larvae or becomes contaminated, change them with a fresh diet bottle.
3. Whenever transferring larvae to a new diet bottle, make a deep centre hole that has the same size of diameter as the larva in the diet, and then gently push the larvae into the hole with surgical-gloved hand.
4. Continue transferring fresh diet bottle until larvae stop feeding and become quiescent.
5. When emergence is completed properly ready-made artificial pupal-chambers are preferred. Prepare the artificial pupal-chambers by using by a dry floral form brick housed in a plastic container and watered.

6. Once the final instar starts to make a pupation chamber inside the diet bottle or becomes quiescent, immediately remove the larva and place them in the artificial pupal chamber.

Preparing pupation and handling pupae

1. Pre-pupae should be left undisturbed in the pupal-chamber in order to prevent morphological anomalies.
2. Do not manipulate pupating larvae or pupae, nor illuminate the pupae.
3. Pupae should be kept in aseptic chambers in order to prevent infection by the white muscardine disease (*Beauveria bassiana* (Balsamo-Crivelli) Vuillemin; Cordycipitaceae).

Rearing adults

1. Do not touch or feed the adults until 4–5 days post emergence (sclerotisation of elytra and a change of body colour from bright yellow to dark brown are good indications that the adults are ready to feed).
2. Do not release males and females until fully sclerotised.
3. Wait at least five days until sexually matured before preparing for mating.
4. Adults should be reared and mated at 25–27 °C with at least 60% relative humidity.
5. Provide commercial sugar gelatins (60 g beetle-jelly preferred) as the adult food and these should be replenished frequently.