

Supplementary Materials for Bright Green Fluorescence of Asian Paper Wasp Nests

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Materials and Methods

Description of the supplementary nests

All nests showed a green/yellowish fluorescence which was particularly strong for *P. brunetus* and *P. japonicus*.

Nests of *P. brunetus*:

1) One nest of the species was collected in Huu Lien NR, Lang Son province in the northeastern part of Vietnam (Nest# VN-LS-2019-P-01), at 267 m altitude. The nest was attached to a branch of a *Gironniera subaequalis* Planch. Tree (family Ulmaceae), at the height of about 1.2 m from the ground, with 19 adults including 15 females and 4 males, subcircular (ca. 55 mm x 62 mm). N.21°39'33.8", E.106°21'55.2"

2) One nest of the species was collected in Lung Cang, Bac Me, Ha Giang province in the northeastern part of Vietnam (Nest#VN-HG-2019-P-01, at 236 m altitude. The nest was attached to stone, at the height of about 2 m, with one female adult, subcircular (ca. 57 mm x 60 mm). N.22°46'25.4", E.105°10'22.7"

Nests of *P. japonicus*:

3) One nest of the species was collected in Huu Lien NR, Lan Nghe, Huu Lung, Lang Son province in the northeastern part of Vietnam (Nest# VN-LS-2018-P-02), at 289 m altitude. The nest was attached to a stone about 1 m from ground, with 4 female adults, almost round (diameter of 40 mm). N.21°33'48.6'', E.106°24'36.4"

4) One nest of the species was collected in Son Phu ranger station, Na Hang N Huu Lien NR, Lang Son province in the northeastern part of Vietnam (Nest# VN-TQ-2015-P-01), at 264 m altitude. The nest was attached about 2.7 m from ground to a ceiling of a house, with 3 female adults, subcircular (ca. 23 mm x 32 mm). N.22°21'07'', E.105°25'34.7"

Nests of *P. lepcha*:

5) One nest of the species was collected in Y Ty, Bat Xat NR, Lao Cai province in the northwestern part of Vietnam (Nest# VN-LC-2019-P-01), at 1586m altitude. The nest was attached to a branch of a non-identified tree, at the height of about 4 m from ground, with 1 female adult, subcircular (about 58 mm x 62 mm). N.21°23'03.4", E.105°42'42.6"

6) One nest of the species was collected in Y Ty, Bat Xat NR, Lao Cai province in the northwestern part of Vietnam (Nest# VN-LC-2019-P-02), at 1800m altitude. The nest was attached to a roof of a house, at the height of about 2 m from ground, with 1 female adult, subcircular (about 20 mm x 34 mm). N.22°37'00.5", E.103°38'06.4"

Fig. S1.

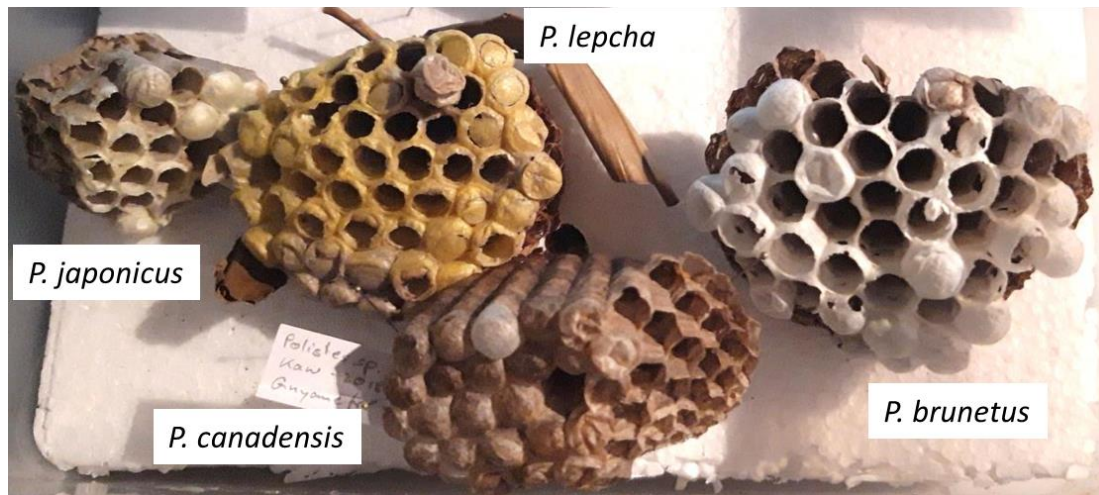


Fig. S1. Collected nests of *P. japonicus*, *P. lepcha*, *P. canadensis* and *P. brunetus*.

Fig. S2.



Fig. S2. Nest of *P. brunetus* under white (left) and UV-A (395 nm, right).

Fig. S3.



Fig. S3. Nest of *P. japonicus* under white (left) and UV-A (395 nm, right).

Fig. S4.



Fig. S4. Nest of *P. lepcha* under white (left) and UV-A (395 nm, right).

Fig. S5.

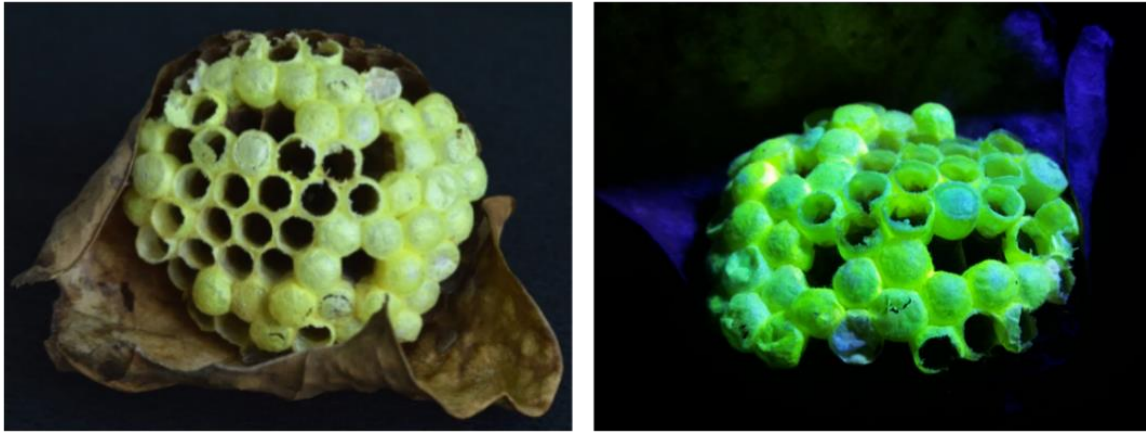


Fig. S5. Nest of *P. sp.* under white (left) and UV-A (395 nm, right).

Fig. S6.



Fig. S6. Nest of *P. gallicus* under white (left) and UV-A (395 nm, right).

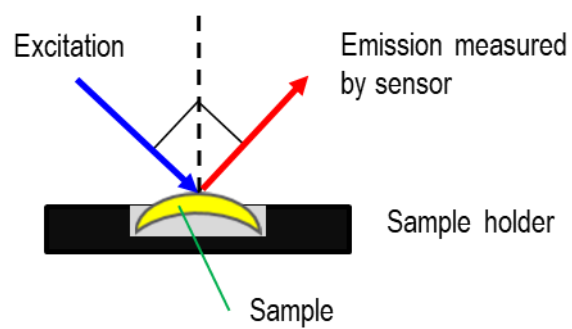
Fig. S7.**Fig. S7.** Experimental setup for recording the fluorescence excitation and emission spectra.

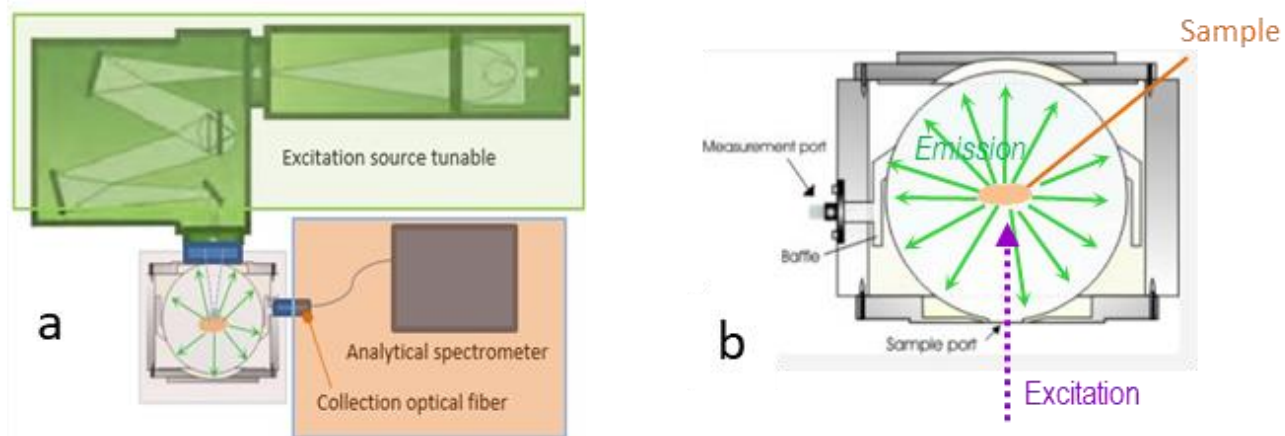
Fig. S8.

Fig. S8. (a) Experimental setup for the determination of absolute fluorescence quantum yields, including a QM400 spectrofluorimeter equipped with a 75 Watt Xe lamp and a PM detector R-928 and an integrating sphere. (b) Position of the sample in the center of the integrating sphere.

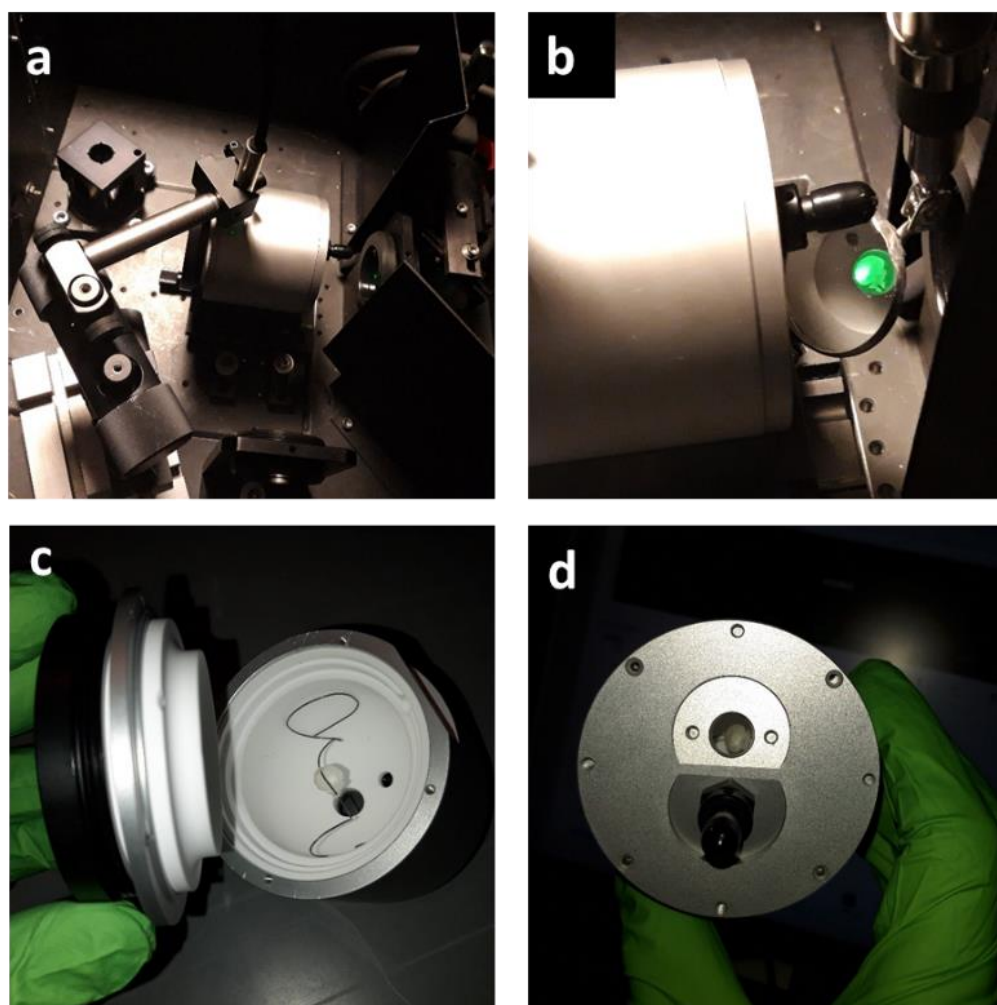
Fig. S9.

Fig. S9. (a) Experimental setup for the determination of absolute fluorescence quantum yields. (b-d) Charging of the integrating sphere with a cocoon cap.

Fig. S10.

4G5P7.7

Mesure	Intensité<Excitation , PL>
date	09/03/2020
éclairage	lampe Ac. QM400 365nm
<e QM400	0,38mm
sys. analys	HR460
Détecteur	spct. HR460. dtct: sincerity CCD
T (k)	ambient
RA/FF/sph	sph. int.
longueur d'	540nm
filtre excita	aucun
filtre emiss	aucun
<e>	0,025nm
T. expo.	0,02s

— I_{pl} *
 — I_{o-It} **
 * photoluminescence intensity
 ** I_o = intensity detected without sample
 I_t = spectrum excitation intensity transmitted by the sample
 $QY = I_{pl} / (I_o - I_t) = (I_{pl} \text{ pic area}) / ((I_o - I_t) \text{ pic area})$

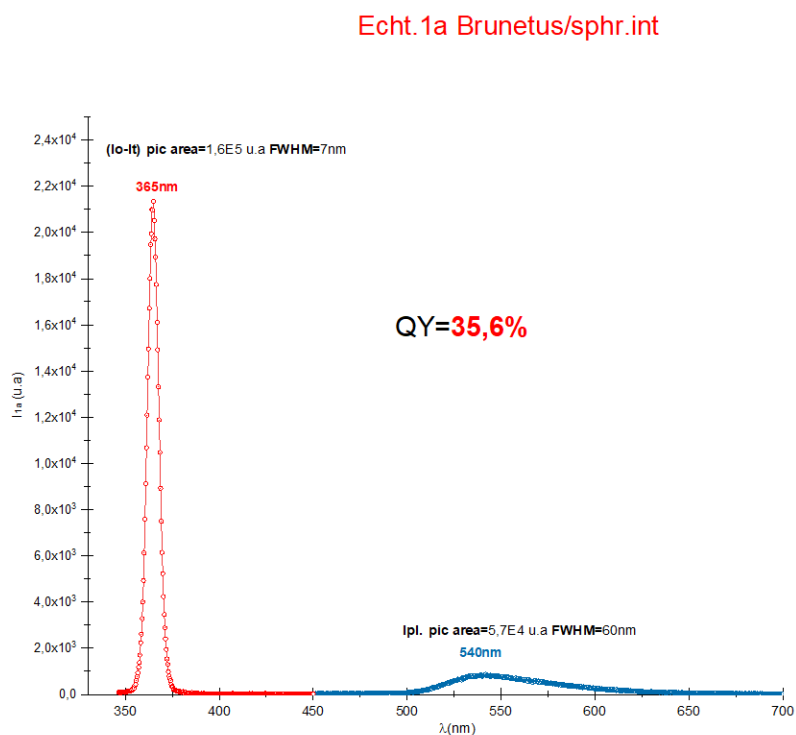


Fig. S10. Determination of the fluorescence quantum yield: fluorescence spectra the cocoon caps from *P. brunetus*, recorded with an integrating sphere.

Fig. S11.

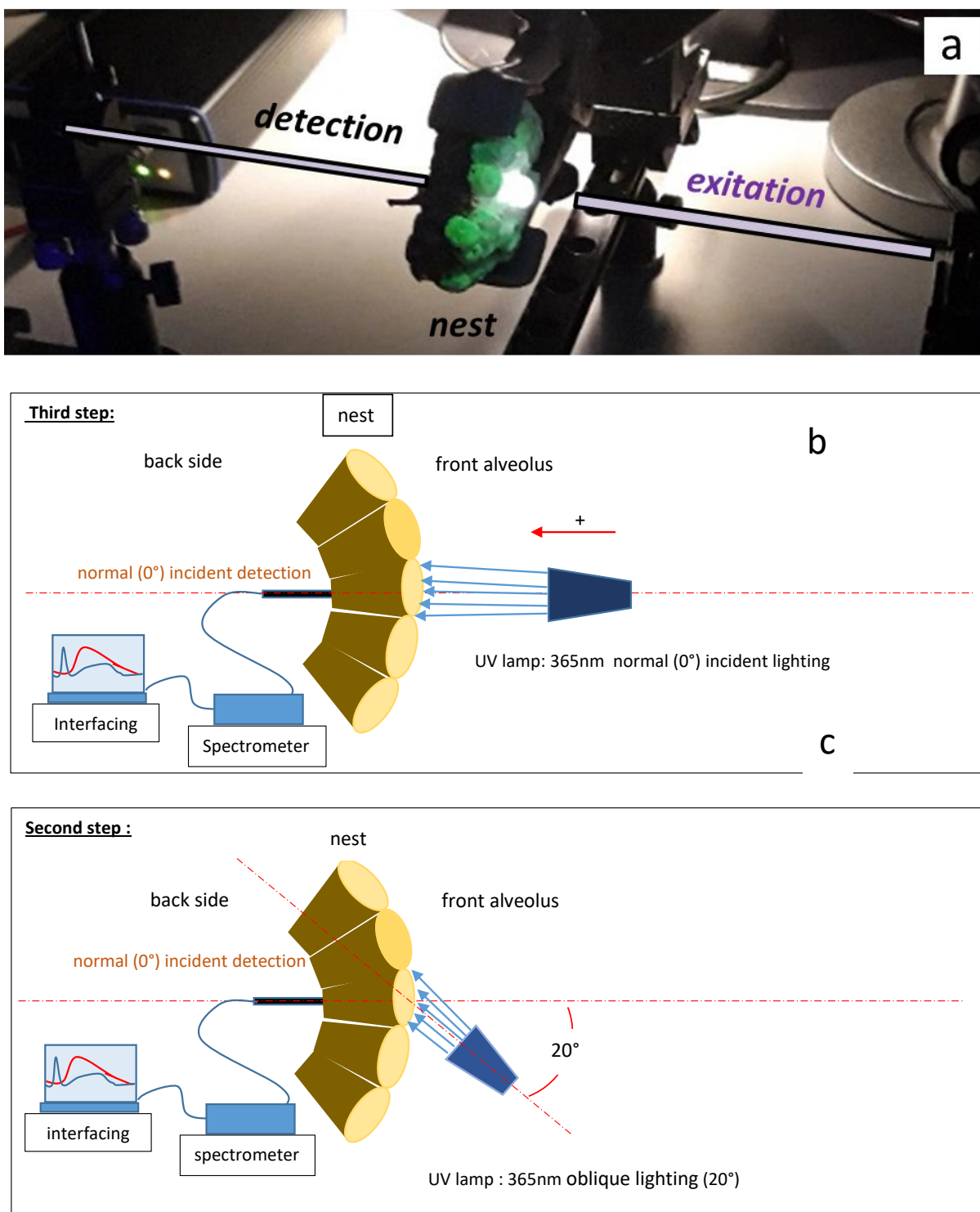


Fig. S11. (a) Experimental setup for the measurement of transmitted light upon irradiation of a cocoon cap with a UV lamp (365nm) at (b) 0° (normal incidence) and (c) at an angle of 20° .