

**Supplementary material 8.** Illustration of the integrative methodology for the galatheids identification from images at morphospecies rank, along the upper sedimented slopes of the Papua New Guinea.

Six groups of galatheids specimens observed in the images were considered to be different species and thus were delimited in 6 different morphospecies and one species was identified both from the images and collected in the surrounding area (Astrolabe Bay and Sepik area). Each of these 6 morphospecies were first assigned to one of the three following genera (*Agononida*, *Munidopsis* and *Munida*). We identified *Agononida* and *Munida* based primarily on identifiable morphological characters in the images while *Munidopsis* identification was combined with habitat context from the frequently image observations of a *Munidopsis*/wood association). These three genera were also identified in the trawls, and each of the three genera gather respectively a pool of potential species sampled and identified in the sampling undertaken along dives or at larger scale (**Table S8**). The morphospecies corresponding to each of these three genera were delimited from morphological differences observable in the images. In the methodological approach applied to our study, a morphological criterion specific to the species must be visible in the images in order to be able to assign a name to the species present in the area. The limits of the observable characteristics did not allow this identification except for the species *Galacantha subspinosa*, Macpherson, 2007. Each morphospecies is therefore associated with a degree of confidence of belonging to a group of potential species because they have been sampled and identified in the area (locally and/or at a larger scale (Astrolabe Bay and Sepik area).

**Table S8.** Galatheids morphospecies identified from images in relation to galatheids species trawled either along dive, or in the surrounding area in the Astrolabe Bay and Sepik area.

Morphospecies	Dive	Sampled species potentially analogous	Spatial scale of sampling
<i>Agononida</i> sp1	18	<i>Agononida isabelensis</i> Cabezas, Macpherson & Machordom, 2009	Around
		<i>Agononida rubrizonata</i> Macpherson & Baba 2009	Around
		<i>Agononida similis</i> (Baba, 1988)	Around
<i>Munida</i> sp1	18 06	<i>Munida compacta</i> Macpherson, 1997	Along dive/ Around
		<i>Munida curvirostris</i> Henderson, 1885	Around
		<i>Munida striola</i> Macpherson & Baba 1993	Around
<i>Munidopsis</i> sp1 ( <i>similior</i> group)	18 16 06	<i>Munidopsis andamanica</i> MacGilchrist 1905	Along dive/ Around
		<i>Munidopsis cylindrophthalma</i> Alcock 1894	Along dive/ Around
<i>Munidopsis</i> sp2 ( <i>andamanica</i> group)	18 06	<i>Munidopsis formosa</i> Wu & Chan 2000	Along dive
		<i>Munidopsis hirsutissima</i> Balss 1913	Transect
<i>Munidopsis</i> sp3	18 16	<i>Munidopsis latimana</i> Miyake & Baba 1966	Around
		<i>Munidopsis nitida</i> A Milne Edwards 1880	Along dive/ Around
<i>Munidopsis</i> sp4	06	<i>Munidopsis</i> sp. nov.	Around
		<i>Munidopsis similior</i> Baba 1988	Along dive/ Around
		<i>Munidopsis sinclairi</i> MacArdle 1901	Along dive/ Around
		<i>Munidopsis subchelata</i> Balss 1913	Along dive/ Around
<i>Galacantha subspinosa</i> Macpherson 2007	16 18 06	<i>Galacantha subspinosa</i> Macpherson 2007	Around