particular honour to have propoſed it to you, as I ſhall be proud of every oportunity to approve myſelf,

Dear Sir,

Your moſt obedient

London, Dec. 14, 1762. humble ſervant

Daniel C. Solander.

CVII. *An Account of the Male and Female Cochineal Inſects, that breed on the* Cactus Opuntia, *or* Indian Fig, *in* South Carolina *and* Georgia: *In a Letter from* John Ellis, *Eſq; to* Peter Wych, *Eſq;*

SIR,

Read Dec. 23, 1762. FINDING the natural hiſtory of Cochineal ſtill defective, (notwithſtanding the diligent inquiries that have been made by many curious perſons into the nature and œconomy of this valuable inſect) for want of a deſcription of the Male, I took the firſt opportunity of endeavouring to illuſtrate it.

Hearing then that this inſect bred in great abundance on the Cactus Opuntia of Linnæus's Species Plantarum, p. 468. in South Carolina and Georgia, where it is a native and grows in great plenty, as well as on the Cactus Coccinellifer of the ſame author, which grows in Mexico, and has been for theſe many years introduced

introduced into Jamaica, I wrote to Dr. Alexander Garden, of Charles Town, South Carolina, to ſend me ſome of the joints of the Cactus Opuntia, with the inſects on it; which he did the latter end of the year 1757. Theſe ſpecimens were full of the neſts of this inſect, in which it appeared in its various ſtates from the moſt minute, when it walks about, to the ſtate, when it becomes fixt, and wrapt up in a fine webb, which it ſpins about itſelf.

Theſe I had the honour to lay before the Royal Society, and afterwards, with a view to encourage the propagating and collecting them in our colonies, I exhibited the ſame to the Society for encouraging Arts, Manufactures, and Commerce, who chearfully granted ſeveral large premiums; the obtaining of which nothing can diſappoint, but ſcarcity of hands at preſent in our colonies. The Female (which was here alive and in plenty) is well diſcribed by Monſ. Reaumur, Dr. Brown of Jamaica, and lately by Dr. Linnæus, in his Syſtem of the animal kingdom, under the title of Coccus Cacti Coccinelliferi p. 457. n°. 17. from a living inſect ſent him from Surinam by Mr. Rolander in the year 1756, but neither Reaumur, Brown, nor Linnæus had ever ſeen the Male.

As this genus of inſects is placed by Dr. Linnæus under the Hemipteræ or half winged, it may be neceſſary to know, that he comprehends in this claſs not only thoſe, whoſe wings are half covered with a cruſtaceous caſe, but ſuch alſo as have wings only on one ſex.

In order to find out the Male fly, I examined all the webbs in theſe ſpecimens beſides a large parcel, which the Doctor had ſent me picked off from the plants

plants in Carolina; and at laſt diſcovered 3 or 4 minute dead flies with white wings: theſe I moiſtened in weak ſpirit of wine, and examining them in the Microſcope, I diſcovered their bodies to be of a bright red colour, which convinced me of their being the true male Cochineal inſect: to be confirmed in my opinion I immediately communicated my diſcovery to Dr. Garden, which I accompanied with an exact Microſcopical drawing, and deſired he would ſend me ſome account of their œconomy, with ſome male inſects of his own collecting, which he was ſo kind to do laſt ſpring with ſome obſervations on them, which are as follows.

" In Auguſt 1759 I catched a male Cochineal " fly and examined it in your aquatic Microſcope. " It is ſeldom a male is met with, I imagine there " may be 150 or 200 females for one male. The " male is a very active creature and well made, but " ſlender in compariſon of the females, who are much " larger and more ſhapeleſs, and ſeemingly lazy, " torpid, and inactive. They appear generally ſo " overgrown that their eyes and mouth are quite " ſunk in their rugæ or wrinkles, nay their antennæ " and legs are almoſt covered by them, and are ſo " impeded in their motions from theſe ſwellings " about the inſertions of their legs, that they ſcarce " can move them, much leſs move themſelves.

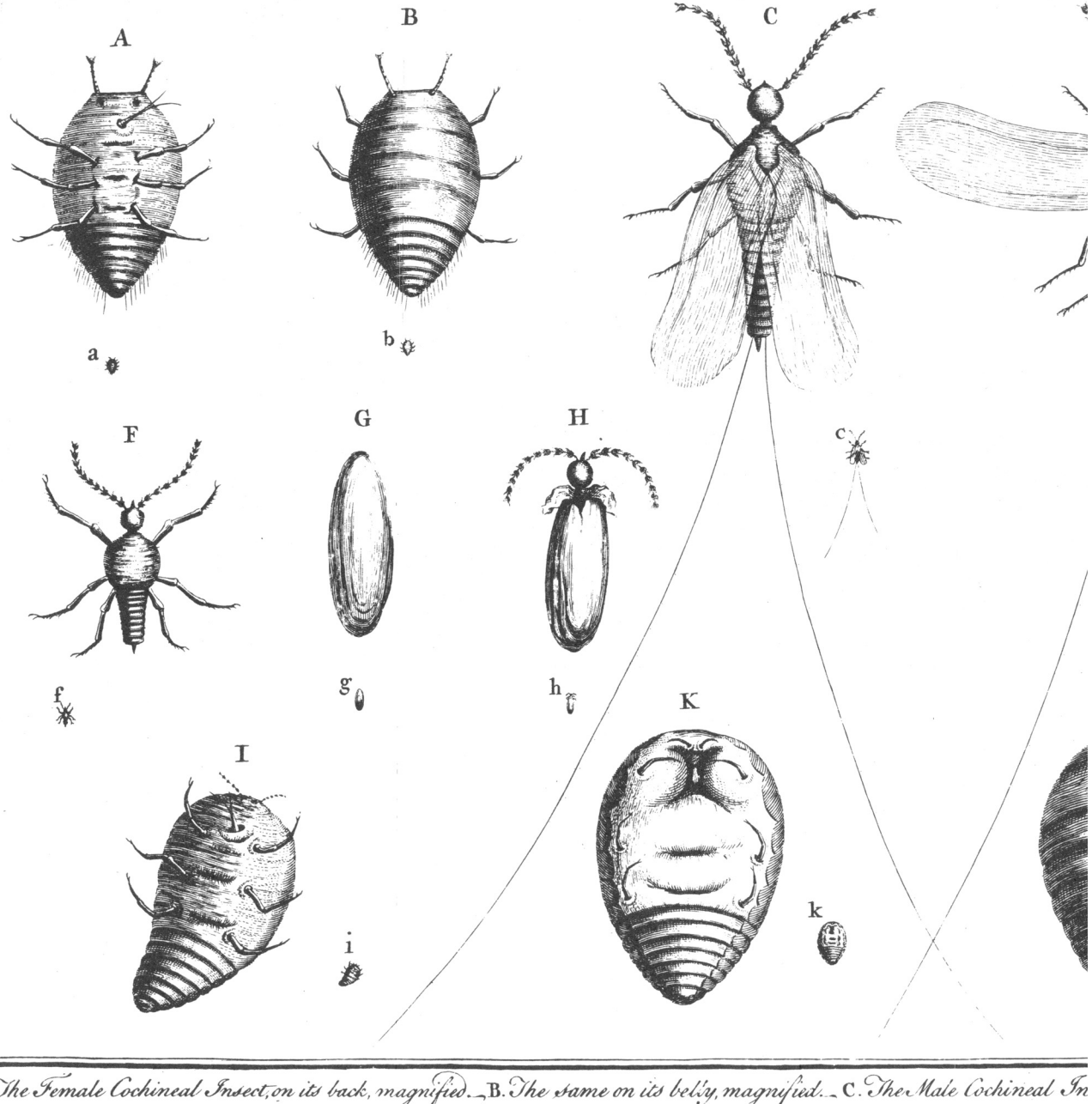
" The male's head is very diſtinct from the neck, " the neck is much ſmaller than the head and much " more ſo than the body. The Thorax is elliptical " and ſomething longer than the head and neck to- " gether, and flattiſh underneath: from the front " there ariſe two long antennæ (much longer than

" the antennæ of the females) which the inſect " moves every way very briſkly. Theſe antennæ are " all jointed, and from every joint there come out " four ſhort ſetæ, placed two on each ſide.

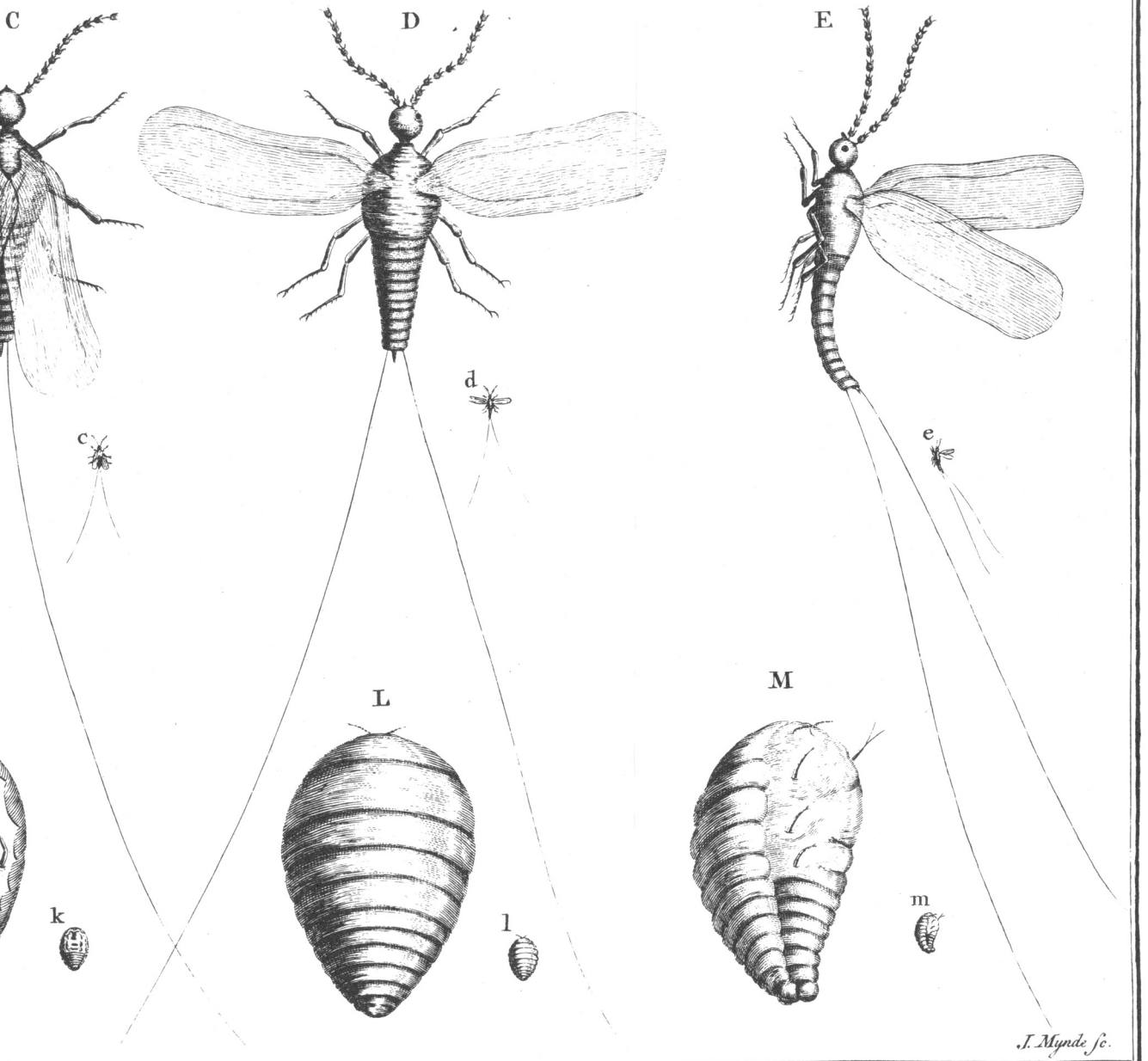
" It has three jointed legs on each ſide, and moves " very briſkly and with great ſpeed. From the extre- " mity of the tail, there ariſe two long ſetæ or hairs, " four or five times the length of the inſect. They " diverge as they lengthen, are very ſlender and of " a pure ſnow white colour. It has two wings " which take their riſe from the back part of the " ſhoulders or thorax and lie down horizontally like " the wings of the common fly, when the inſect is " walking: they are oblong, rounded at the extre- " mity, and become ſuddenly ſmall near the point " of inſertion: they are much longer than the body " and have two long nerves, one runs from the ba- " ſis of the wing along the external margin and " arches to meet a ſlender one that runs along the " underd an inner edge: they are quite thin, ſlender " tranſparent, and of a ſnowey whiteneſs. The bo- " dy of the male is of a lighter red than the body " of the female, and not near ſo large."

To this deſcription of Dr. Gardens, which agrees very nearly with the annexed microſcopical drawings of both ſexes of this inſect, A and C. Tab. XXI. I muſt add that the female has a remarkable proboſcis or awl ſhaped papilla, that ariſes in the midſt of the breaſt. This Linnæus calls the Roſtrum, and thinks it the mouth; if ſo, beſides the office of ſupplying it with nouriſhment during the time of its moving about, it is the tube though which the fine double filament proceeds, with which it forms its delicate white

webb



A. The Female Cochineal Insect, on its back, magnified. B. The same on its belly, magnified. C. The Male Cochineal In
tended, magnified. E. The Male Cochineal Insect, in a side view flying, magnified. F. The Male Insect, as it is found wi
Wings are expanded. H. The Silk-bag cut open, which discovers the Head of the Male Insect, magnified. I. The appeara
side Views of the Female Cochineal Insect, when it come to perfection and big with young, magnified.
(a. & b.) The natural size of the Female Cochineal Insect, when it creeps about. (c. d. e) The natural size of the Male Cochinea
The Silk-bag of the Male Fly. (h.) The top of the Silk-bag cut open to shew y^e Head of the Male Fly. (i) The Female before it sp



mified. C. *The Male Cochineal Insect, as it walks, magnified.* D. *The Male Cochineal Insect, with its Wings ex-*
The Male Insect, as it is found without Wings, magnified. G. *The Silk-bag, which the Male Insect spins, before its*
Insect, magnified. I. *The appearance of the Female when it first begins to spin, magnified.* K.L.M. *The front, back, &*
vith young, magnified.

natural size of the Male Cochineal Fly, in three different Views. (f.) *The Male Insect, as it is found without Wings.* (g.)
Male Fly. (i) *The Female before it spins.* (k.l.m.) *The natural size of y^e Female Cochineal when it becomes fit for use, in 3 Views.*

webb in order to accommodate itſelf in its torpid ſtate, during its pregnancy; till the young ones creep out of its body, ſhift for themſelves, and form a new generation.

In this torpid ſtate the legs and antennæ grow no more, but the animal ſwells up to an enormous ſize in proportion to its firſt minute creeping ſtate. The legs, antennæ, and proboſcis are ſo ſmall with reſpect to the reſt of the body, that they cannot be eaſily diſcovered without very good eyes or magnifying glaſſes; ſo that, to an indifferent eye, it looks full as like a berry as an animal.

This was the occaſion of that conteſt mentioned by Pomet and other authors, which ſubſiſted ſo many years, whether it was an animal or a vegetable production. But if perſons of curioſity would give themſelves the trouble to ſoak a few grains of the common Cochineal of the ſhops in warm water for 24 hours, they will obſerve them to ſwell up to their original ſhape; ſo that the legs, antennæ, and proboſcis may be diſcovered. What is remarkable in the proboſcis is, that we ſhall find in many of them the ends of two fine hairs or filaments remaining, with which it forms its webb, not unlike the ſilk worm; which always ſpins its cocoons with two threads, which, as they come out, unite together, with the nutural gluten of the animal.

Further, if this animal, thus expanded by moiſture, is opened in a watch glaſs with a fine lancet in a little water, a great number of eggs with the young animals in them may be diſcovered, which will exhibit a very agreeable ſcene of a moſt vivid crimſon hue.

As ſoon as the female inſect is delivered of its numerous progeny, it becomes a meer huſk and dies; ſo that great care is taken in Mexico, where it is principally collected, to kill the old ones while big with young, to prevent the young ones eſcaping into life, and depriving them of that beautiful ſcarlet die ſo much eſteemed by all the world.

I am,

Sir,

Park-Street, Weſtminſter,
December 23, 1762.

Your moſt obedient ſervant,

John Ellis.

P. S. The

P. S. The following are the characters of this inſect called Coccus Cacti Opuntiæ, drawn up in Latin in the ſyſtematical manner of Doctor Linnæus, to be placed among the inſecta hemiptera.

Coccus Cacti Opuntiæ.

Mas alatus. — *Corpus* magnitudine pulicis, glabrum, rubrum.

Caput globoſum; *Antennæ* moniliformes, thorace paulo longiores decem articulatæ. *Collum* protractum. Thorax ovatus poſtice truncatus.

Abdomen thorace paulo longius, poſtice anguſtatum, ſegmentis decem, ultimo appendice ſubulato brevi terminato.

Setæ caudales duæ, capillares, corpore quadruplo longiores.

Alæ oblongæ, abdomine longiores apice rotundatæ, baſi anguſtatæ, thoracis ante medium inſertæ.

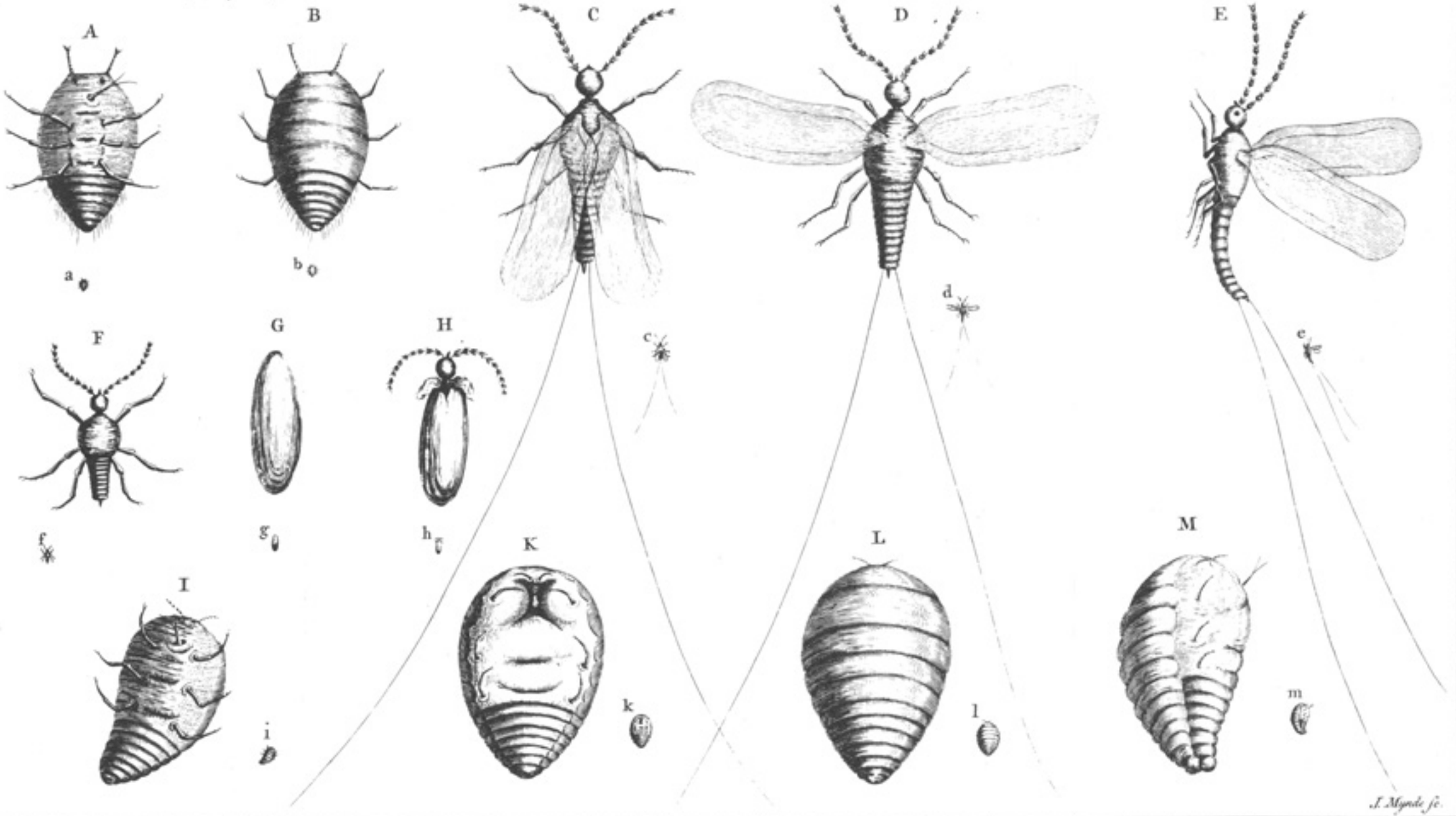
Pedes ſex ſubæquales.

Femina aptera. *Corpus* magnitudine ſeminis viciæ, ovatum, rubrum, rugoſum. *Antennæ* breves articulatæ.

Pedes 6, in junioribus inſerti, ſed in adultis intra rugas conditi, uti et artus reliqui.

Thorax glaber ſupra convexus, rugoſus, ſubtus planiuſculus, abdomine duplo longior.

Roſtrum vel *os* punctum ſubulatum e medio pectoris, ſegmenta abdominis in junioribus margine piloſa.



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(a. & b.) The natural size of the Female Cochineal Insect, when it creeps about. (c. d. e) The natural size of the Male Cochineal Fly, in three different Views. (f.) The Male Insect, as it is found without Wings. (g.) The Silk-bag of the Male Fly. (h.) The top of the Silk-bag cut open to shew ye Head of the Male Fly. (i.) The Female before it spins. (k.l.m.) The natural size of ye Female Cochineal when it becomes fit for use, in 3 Views.