schnittes finden sich im Mittelteil der Basis des Pronotums nur kurze Tubuli. Die gegenüber dem Scutellum konvexe Basis ist in ganzer Länge mit einer feinen Leiste versehen.

Bei den Elytren hat der Discus die gleiche Farbe wie die Randpartien, doch ist die Sutura verdunkelt. Der Schulterbuckel ist groß, oft ein wenig dunkel gekernt. Die Pseudoporen an der Basis sind scharf eingedrückt und gleich der Punktreihe an der Grenze vom Discus zur Randpartie schwarz pigmentiert. Die übrigen Punkte sind nur mäßig tief und nicht pigmentiert. Die Tuberkelkanäle erreichen nicht ganz die Mitte der Randpartie, sie sind an der Porenöffnung etwas erhöht und wie die Tubuli mehr oder weniger pigmentiert.

Ober- und Unterseite des Körpers sind mit kurzen, feinen, gelbgrauen Haaren besetzt. Die Fühlerkeule des Männchens ist breit dreieckig mit leicht betonter Ecke an der Vorderseite, die Keule des Weibchens ist deutlich schmaler (in der Zeichnung punktiert). Größe: $2,0 \times 1,47$ mm.

Material: 8 Exemplare (Typus ♂ ♀, Paratypen) im Deutschen Entomologischen Institut. Fundort: S. Catarina, Brasilien, leg. LÜDERWALDT.

Studies on "Skeleto-Muscular Mechanism" of the Male Genitalia in *Stenobracon deesae Cam.*

(*Hymenoptera: Braconidae*)

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(With 10 Text Figures)

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Introduction

The study of the external genitalia of the male insects can conveniently be split up into two sections — one dealing with the origin and homologies

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of the genitalia and associated structures; and the other consisting of description of these structures in the imagines. These studies have been combined in a comprehensive way by SNODGRASS (1936—41), and QADRI (1940 and 1949). Besides, there are other works as well which contribute sufficient knowledge to one section or the other.

This paper deals with the skeleto-muscular mechanism of the external male genitalia of *Stenobracon deesae Cam.* A concise account of the counterpart of this study, that is, "origin of the male genitalia of *Stenobracon deesae*" has already been published by the author (1951). As such its inclusion here will amount to mere repetition of already published work. The entire study of the genitalia is done not with the idea of simply describing its various components and their muscles but to be exact, as far as possible, in specifying them with functions. Furthermore, comparative touch has been given by keeping under consideration various recent works on the male genitalia of hymenopterous insects. This will go a long way in meeting out ambiguities and uncertainties on the functional side of the genitalia.

The study of the myology confirms the previous expression of the present writer (1951) on the origin of the genitalia from the ninth sternum which is a collaboration of the recent view of SNODGRASS (1941). In dealing with musculature, care has been taken, to find out the course of action of muscles and not to be contented with the mere description on the origin and insertion. This has immensely helped in tracing out systematic working of the genitalia at the time of copulation.

It is regretted that the work of BOULANGÉ (1924)[1]) could not be consulted inspite of all possible efforts made for its availability. But this drawback has been compensated to a very great extent by making full use of the classical work of SNODGRASS on the male genitalia of *Hymenoptera* (1941) which deals at length with the essence of BOULANGÉs work.

This paper forms a part of the extensive work done by the present writer on the "Skeleto-muscular mechanism of *Stenobracon deesae*". The latter will take some time to be published in full in the Aligarh Muslim University publications, (Zoological Series). Meanwhile it appears reasonable to release the present work for publication so that entomologists may be acquainted at an early date with points of morphological significance contained in it.

Material and Technique

Picro-chloracetic fixative was used for fixation. This proved to be very successful fixative and caused no damage to the material even when left in it for a little over twelve hours. At the expiry of the 12 hour duration the material was transferred to 70% alcohol for several wash before it could be made available for studies.

[1]) BOULANGÉ, H., Recherches sur l'appareil copulateur des Hyménoptères et spécialement des Chalastogastres. Mém. Trav. Fac. cathol. Lille, **28**, 1—444, 1924.

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The well sclerotized male genitalia was softened by treating it with 5—10% KOH. It was invariably put to decolorisation by warming it with Potassium dichromate and Hydro-chloric acid. The process of decolorisation was followed by several wash in plain water to remove all traces of decolorising materials. All decolorised structures were stained in Carbol-aniline; and later on, were treated with Carbol-xylol to prepare permanent mounts for microscopic studies.

The myology of the genitalia was studied under binocular with the help of Borax carmine and Mallory's fluid as stains. The second stain proved to be of immense utility in the study of musculature. Permanent slides of muscles with this stain contained maximum amount of differentiations for detailed microscopic studies. Furthermore, the Mallory's fluid, also served the purpose of providing temporary, bright coloration to the structures under observation with good deal of temporary differentiations of points of origin and insertion and course of action of muscles.

Acknowledgment

The writer considers his foremost duty to express his heartfelt indebtedness to Dr. M. A. H. Qadri, for the most valuable suggestions and guidance he has given during the period the work was under observation. He also extends his gratitudes to Prof. M. B. Mirza for revising the manuscript before communicating it for publication. Thanks are also due to Mr. Shujaat Akbar, Research Scholar, for preparing drawings for this paper.

The Genitalia

The sclerotized male genitalia of *Stenobracon deesae* is a prominent structure of the abdominal region. Its proximal structures are placed in the lap of the IX sternum while the distal portion is exposed. It has conspicuously broad membranous connections with the neighbouring segmental plates to help at the time of copulation.

Basal Ring (Figs. 1, 2, 6 and 9; BR). — The basal ring is, more or less, a complete ring having its ventral portion conspicuously broad (Figs. 5, 7, 8; vBR). The postero-lateral angles of the latter are drawn upwards as narrow sclerotic extensions which combiningly form the dorsal portion of the ring (Figs. 1, 5, 6 & 8; dBR). This narrow dorsal portion lies in the ninth segment and enjoys postero-dorsal position in respect to the ventral portion for reasons of inequality in their width. The latter is proximally extended into the preceding segment where it ends into a knobular "gonocondyle" (Figs. 1, 2, 5 & 6; gc). The foramen of the basal ring is dorsoanterior and permits communications to the haemocoele with the phallic cavity (Figs. 5, 7 & 9; For). The entire posterior margin of the basal ring (Figs. 1, 5, 6 & 7; dBR, pm) encircles the basal parts of the paired parameral plates; and the two structures are in membranous connections with one another (Figs. 1, 6 & 8; conj).

Parameral plates (Figs. 1, 7, 8 & 9; lp). — There is a pair of parameral plates bearing parameres distally. The parameral plates are laterally curved and in conjunction with the parameres form the lateral boundary of the genitalia. The proximal portion of each parameral plate is broad and possesses an incomplete basal rim. The dorsal ends of the two rims

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(Figs. 1 & 6; a), in a convergent manner, extend forward and ultimately unite to form the "Sclerotized bridge" (Figs. 1 & 6; B). The dorso-mesal margins of the plates (Figs. 1, 6 & 7; b), extending in postero-lateral direction, from sclerotized bridge to the parameres, flank a space from both sides. This space is occupied by the median plate of the aedeagus (Figs. 1 & 3A; pt). The ventral ends of the basal rims (Figs. 2, 6 & 9; a_1)

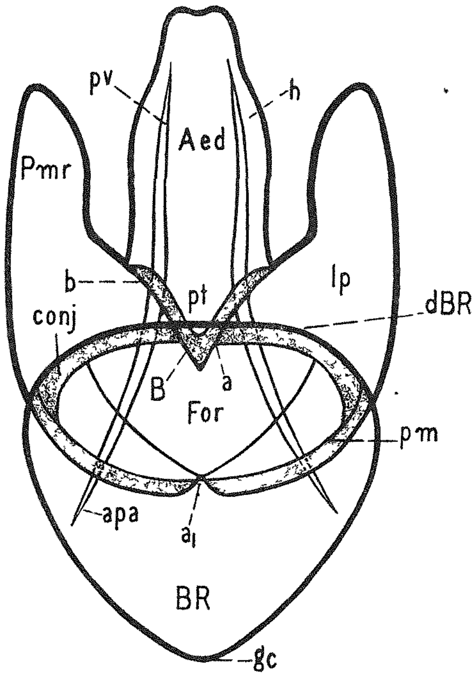

Fig. 1. *Stenobracon deesae Cam.* Dorsal view of genitalia with volsellae removed.

a, dorsal end of basal rim; a_1, ventral end of basal rim; Aed, aedeagus; apa, aedeagal apodeme; B, sclerotized bridge; b, dorso-mesal margin of parameral plate; BR, basal ring; conj, conjunctiva; dBR, dorsal portion of basal ring; For, foramen of basal ring; gc, gonocondyle; h, dorsal wall of aedeagus; lp, parameral plate; pm, posterior margin of ventral portion of basal rıng; Pmr, paramere; pt, aedeagal median plate; pv, penis valve

meet mesally and the two ventro-mesal margins of the parameral plates (Figs. 2, 7 & 9; b_1), extending from their point ot union to the parameres, enclose a big space occupied by paired volsellae. The parameres (Figs. 2, 7 & 8; Pmr) are finger-like and sparsely spined ventrally. There are no sutural demarcation between parameral plates and the parameres; and the lumina of the two are continuous.

Volsellae (Figs. 2 & 8; Vol). — There is a pair of volsellae lying ventro-median in respect to parameral plates. Each volsella consists of a rectan-

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gular "basi-volsella" (Fig. 2; bv) and a pair of distal lobes called "digitus and cuspis". The lateral margin of basi-volsella (Figs. 2 & 8; Lmbv) is in membranous connection with the ventro-mesal margin of the parameral plate of its side (Fig. 2; conj). The mesal margin of each basi-volsella (Fig. 2; Mmbv) runs parallel to that of the other side with a portion of median ventral septum of the aedeagus enclosed between them. The

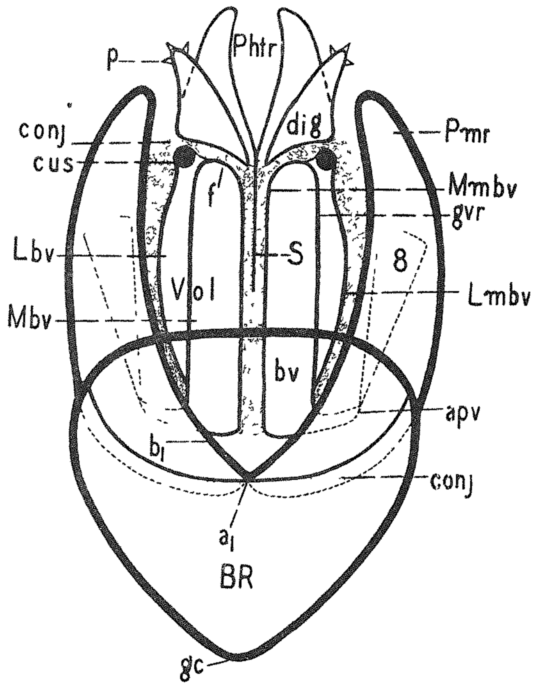

Fig. 2. *Stenobracon deesae Cam.* Ventral view of genitalia.

a_1, ventral end of basal rim; apv, basal apodeme of volsella; BR, basal ring; b_1, ventro-mesal margin of parameral plate; bv, basivolsella; conj, conjunctiva; cus, cuspis; dig, digitus; f, distal margin of basivolsella; gc, gonocondyle; gvr, longitudinal external groove; Lbv, lateral basivolsella, Lmbv, lateral margin of basivolsella; Mbv, mesal basivolsella; Mmbv, mesal margin of basivolsella; p, projection of digitus; Phtr, phallotreme; Pmr, paramere; S, septa of aedeagus; Vol, volsella; 8, muscle

antero-lateral angle is produced as "basal apodeme" (Figs. 2 & 8; apv) into the lumen of the parameral plates. A longitudinal external grove (Fig. 2; gvr) with a corresponding internal ridge (Fig. 8; vr) divides the basi-volsella into a narrow lateral and a broad mesal regions (Figs. 2 & 8; Lbv, Mbv). The cuspis (Figs. 2 & 8; cus) is inseparable from lateral basi-volsella. It is formed as a blunt protrusion of latter's postero-lateral angle. The mandible-like digitus (Figs. 2, 8 & 10; dig) is an independent structure having its curved basal margin (Fig. 8; d) in conjunctival connection

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(Figs. 2 & 8; conj) with the distal margin (Figs. 2 & 8; f) of the basi-volsella of its side. Distally it contains three chitinous projections (Figs. 2 & 10; p).

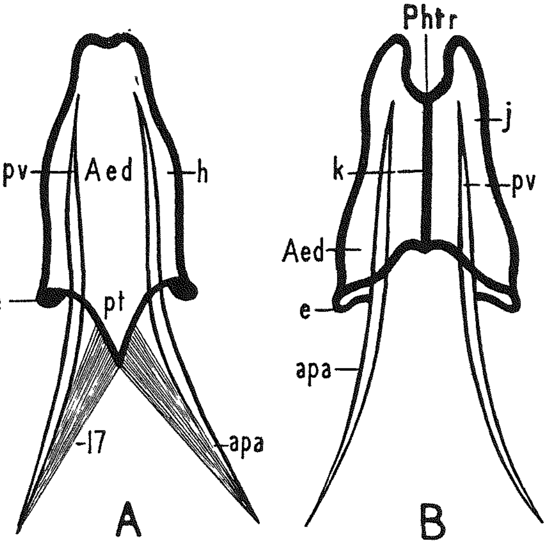

Fig. 3. *Stenobracon deesae Cam.* A: Dorsal view of entire aedeagus. B: same ventral view. Aed, aedeagus; apa, aedeagal apodeme; e ergot; h, dorsal wall; j, ventral wall; k, longitudinal slit; Phtr, phallotreme; pt, median plate; pv, penis valve; 17, muscle

Aedeagus (Figs. 3, 4 & 7; Aed). — The aedeagus is the true intromittent organ. It contains the terminus of the ejaculatory duct, and has acquired mid-dorsal position among the components of the genitalia. The proximal portion is broad while the distal is bluntly narrow. The dorsal wall (Figs. 1, 3A & 4; h) is entire and convexed and basally extends as "median plate of aedeagus" (Figs. 1, 3A & 7; pt) which has membranous connections with the meso-dorsal margins of the parameral plates (Fig. 7; conj). The ventral wall has two plates which are laterally fused with the dorsal wall (Figs. 3B & 9; j). The proximal three fourth length of the mesal margins of these plates are modified into ventrally directed septa (Figs. 2 & 4; S), which run apposed to each other enclosing a very narrow longitudinal slit (Fig. 3B; k). Distally septal formation is lacking and the mesal margins diverge to enclose an oval space called "Phallotreme" (Figs. 2, 3B & 9; Phtr). The septal formation has not so far been recorded in

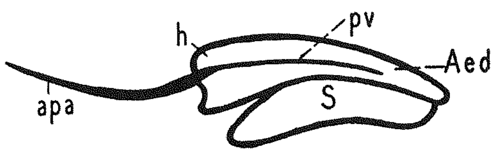

Fig. 4. Lateral view of aedeagus. Aed, aedeagus; apa, aedeagal apodeme; h, dorsal wall; pv, penis valve; S, septum

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Hymenoptera. The paired ergots are modified latero-proximal angles of the ventral wall (Figs. 3, 7 & 9; e). Laterally the aedeagus is traversed by a pair of sclerotized "Penis-valves" (Figs. 3, 4 & 7; pv). These basally emerge from it in the form of a paired elongated "Aedeagal apodemes" (Figs. 1, 3, 4 & 7; apa) which extend anteriorly to lie mesal to the lateral portions of the basal ring. The penis valves and the aedeagal apodemes may be compared with the aedeagus ribs and aedeagus arms respectively of *Harmolita graminicola Gir.*

The Musculature of genitalia

The genitalia mostly consists of paired set of similar structures which have paired set of similar muscles. The basal ring and the penis, though unpaired, are furnished with paired muscles. The entire myology consists of extrinsic and intrinsic muscles. The extrinsic muscles owe their separate origin to the IX sternum of the abdomen. The instrinsic ones are confined within the genitalia and have full control of the activities of its various components. The entire series of muscles functioning in a co-ordinative and simultaneous manner amount to the working of the genitalia. The following description deals with the musculature of one set only which will apply to the second set as well.

Extrinsic muscles

Outer protractor of genitalia (Fig. 5; No. 1). — The outer protractor arises from the lateral area of the ninth sternum and running in antero-mesal direction ends on the gonocondyle. The contraction of this

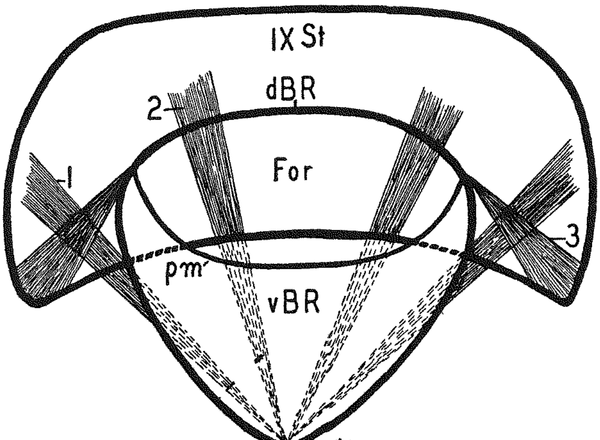

Fig. 5. *Stenobracon deesae Cam.* Dorsal view of basal ring.

bBR, dorsal portion; For, foramen; gc, gonocondyle; pm, posterior margin of ventral portion; IXSt, ninth sternum; vBR, ventral portion; 1—3, muscles

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muscle pulls back the basal ring which in its turn protrudes the genitalia. It is comparable with the muscle "C" of *Megarhyssa lunator* described by Peck.

Inner protractor of genitalia (Fig. 5; No. 2). — The inner protractor arises slightly postero-mesal to the outer protractor muscle; and adopting, more or less, parallel course with the latter ends on the ventral

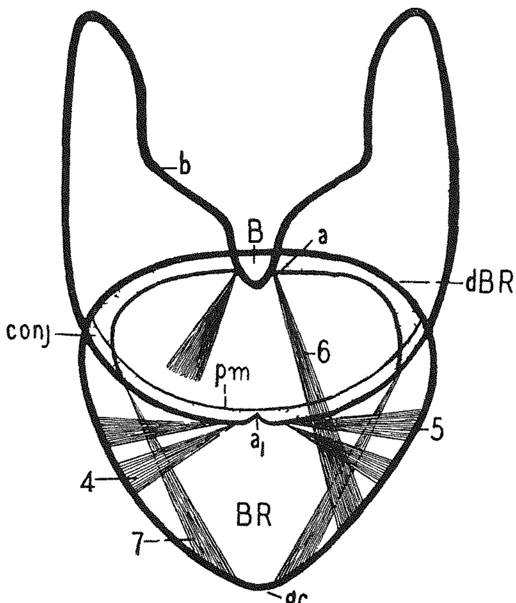

Fig. 6. *Stenobracon deesae Cam.* Dorsal view of basal ring with parameral plates.

a, dorsal end of basal rim; a_1, ventral end of basal rim; B, sclerotized bridge, b, dorso-mesal margin of parameral plate; BR, basal ring; conj, conjunctiva; dBR, dorsal portion of basal ring; gc, gonocondyle; pm, posterior margin of ventral portion of basal ring; 4—7, muscles

face of the gonocondyle. Functionally, it is a sister muscle of the outer protractor.

Retractor of genitalia (Fig. 5; No. 3). — This muscle originates near the antero-lateral angle of the ninth sternum and after persuing a dorso-posteriorly directed course ends on the ventro-lateral wall of the basal ring. Its contraction pulls the basal ring back into the abdomen, and thereby, the genitalia as a whole gets retracted.

Snodgrass (1941) has not gone beyond labelling the above three muscles simply as "extrinsic muscles". It appears that Boulangé (1924), as well, has not assigned specific functions to these muscles.

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Intrinsic muscles

First adductor of paramere (Fig. 6; No. 4). — The first adductor muscle originates from the side of the ventral portion of basal ring. It takes up a meso-dorsal directed course to end on the ventral tip of the basal rim of the parameral plate. It resembles muscle "E" of *M. lunator.*

Second adductor of paramere (Fig. 6; No. 5). — This muscle arises close to the first adductor but slightly posterior to it. Running almost

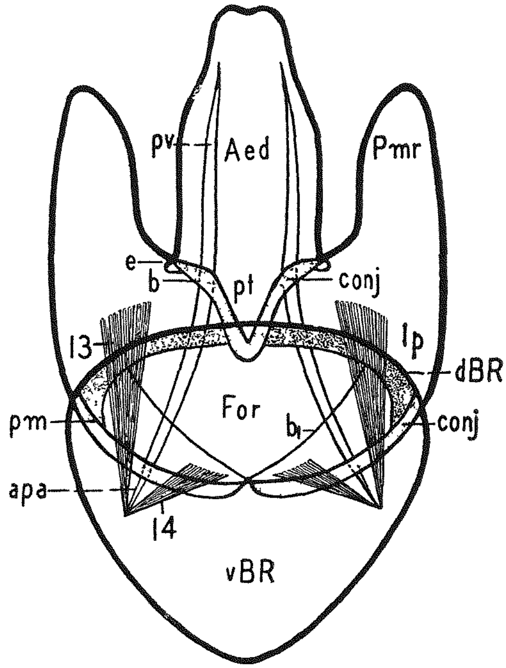

Fig. 7. *Stenobracon deesae Cam.* Dorsal view of genitalia with volsellae removed. apa, aedeagal apodeme; Aed, aedeagus; b, dorso-mesal margin of parameral plate; b_1, ventro-mesal margin of parameral plate; conj, conjunctiva; dBR, dorsal portion of basal ring; e, ergot; For, foramen; lp, parameral plate; pm, posterior margin of ventral portion of basal rim; Pmr, paramere; pt, aedeagal median plate; pb, penis valve; vBR, ventral portion of basal ring; 13—14, muscles

parallel to the latter ends on the ventral basal rim of the parameral plate very close to the insertion of the first adductor. There is no corresponding muscle in *M. lunator.*

Third adductor of paramere (Fig. 6; No. 6). — This muscle arises from the side of the ventral portion of basal ring slightly anterior to the first adductor muscle. It takes up postero-dorsal course and crosses dorsally the remaining two adductors to end on the dorsal tip of the basal rim of the parameral plate. It is comparable to muscle "G" of *M. lunator* though Peck assigns no definite function to it.

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Abductor of paramere (Fig. 6; No. 7). — The abductor muscle originates from the side of the ventral portion of basal ring slightly anterior to the third adductor muscle. Running in latero-dorsal directed course and ventral to all the three adductors it ends on the lateral part of the basal rim of parameral plate.

Protractor of volsella (Figs. 2 & 8; No. 8). — This muscle arises from the paramere and running in antero-mesal direction ends, by a definite

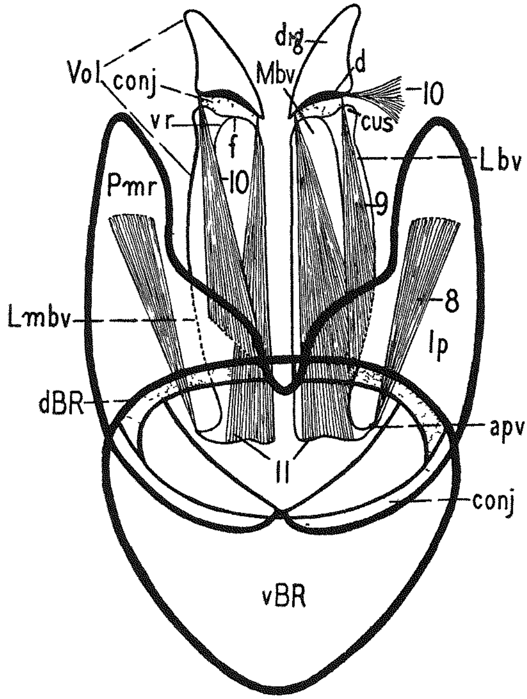

Fig. 8. *Stenobracon deesae Cam.* Dorsal view of genitalia with aedeagus removed. apv, basal apodeme of volsella; conj, conjunctiva; cus, cuspis; d, basal margin of digitus; dBR, dorsal portion of basal ring; dig, digitus; f, distal margin of basivolsella; Lbv, lateral region of basivolsella; Lmbv, lateral margin of basivolsella; lp, parameral plate; Mbv, mesal region of basivolsella; Pmr, paramere; vBR, ventral portion of basal ring; Vol, volsella; vr, longitudinal bridge of basivolsella; 8—11, muscles

tendon, on the basal apodeme of the volsella. On contraction the volsella is pulled out and consequently its digitus moves to lie beyond the aedeagus. It resembles muscle "O" of *M. lunator* described by PECK.

First flexor of digitus (Figs. 8 & 10; No. 9). — The fibres of the first flexor arise both from the lateral plate and the internal longitudinal ridge of the basi-volsella. These converge to form a tendon which is inserted at the outer angle of the digitus. Its contraction bends the digitus outward. This muscle is similar to muscle "21" of *Hymenoptera* described by SNOD-

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GRASS (1941). The latter writer is not clear on its exact point of insertion, as well as, of its function; hence the present writer would like to suggest that the term "intrinsic muscle of the volsella" be substituted by the term "first flexor of digitus".

Second flexor of digitus (Figs. 8 & 10; No. 10). — This muscle starts from the dorsal portion of the basal rim of the parameral plate, and ends by means of a tendon, on the digitus slightly lateral to the first

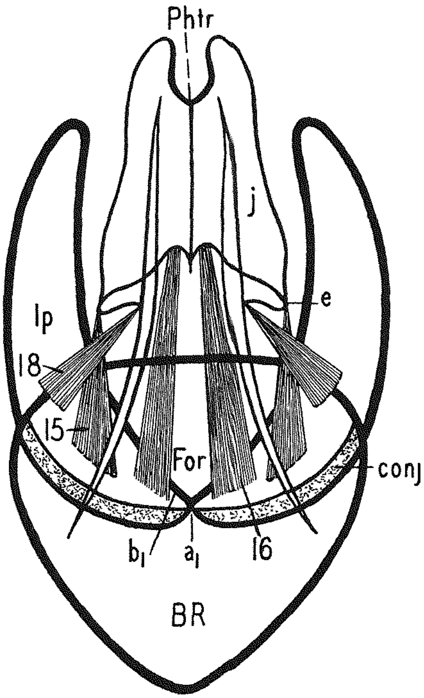

Fig. 9. *Stenobracon deesae Cam.* Dorsal view of genitalia with volsellae removed.

a_1, ventral end of parameral plate; b_1, ventro-mesal margin of parameral plate; BR, basal ring; conj, conjunctiva; e, ergot; For, foramen of basal ring; j, ventral wall of aedeagus; lp, parameral plate; Phtr, phallotreme; 15—16 & 18, muscles

flexor muscle. It is a new muscle and should not be confused with muscle "P" of *M. lunator*.

First extensor of digitus (Figs. 8 & 10; No. 11). — The fibres of the first extensor arise from the inner part of the volsella and running in posterior direction form a tendon which ends in the inner angle of the digitus. It is similar to "volsellor extensor of the digitus" of *Hymenoptera* described by SNODGRASS.

Second extensor of digitus (Fig. 10; No. 12). — The second extensor muscle originates from the aedeagal apodeme by wrapping it from

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all sides. It adopts ventro-posterior convergent course to end, by means of a tendon, on the digitus slightly mesal to the first extensor. It is comparable to muscle "N" of *M. lunator*.

First protractor of aedeagus (Fig. 7; No. 13). — It is a very stout muscle with fibres arising from the dorsal portion of the basal rim of parameral plate. These fibres running in ventro-lateral direction converge on the outer face of the proximal tip of the aedeagal apodeme. An exactly similar muscle has been labelled "H" in *M. lunator* by Peck, with the function of simply raising the aedeagus at the time of copulation. The present writer is rather unconvinced with the observations of Peck and would suggest the term "protractor of the aedeagus" to be used for this muscle.

Second protractor of aedeagus (Fig. 7; No. 14). — This muscle arises from the ventral portion of the basal rim of parameral plate. Its fibres converge in antero-lateral direction to end on the mesal face of the proximal tip of the aedeagal apodeme. The presence of this muscle strengthens the stand taken by the present writer in respect to the function of muscle "H" in *M. lunator*. In this insect Peck has not described any counterpart of the second protractor of aedeagus of *Stenobracon deesae*.

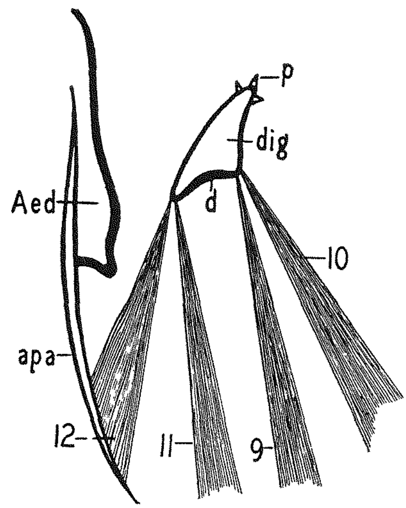

Fig. 10. *Stenobracon deesae Cam.* Digitus and a portion of aedeagus. Aed, aedeagus; apa, aedeagal apodeme; d, basal margin of digitus; dig, digitus; p, projection; 9—12, muscles

First retractor of aedeagus (Fig. 9; No. 15). — The first retractor of aedeagus originates from the ventral portion of the basal rim of parameral plate but posterior to the second protractor of aedeagus. This muscle, running in posterior direction, ends on the ergot. Its function is to restore the aedeagus back to its normal position and as such can be compared with muscle "I" of *M. lunator*.

Second retractor of aedeagus (Fig. 9; No. 16). — This muscle arises from the ventral portion of the basal rim of parameral plate but mesal to the first retractor. It adopts a course similar to that of the latter but mesal to it to end on the proximal margin of ventral wall of aedeagus.

Adductor of aedeagal apodeme (Fig. 3A; No. 17). — The fibres of this muscle arise from the side of the median plate. These run in antero-lateral direction to end on the meso-dorsal face of the aedeagal apodeme. Its contraction pulls the apodeme inward to reduce the inter-apodemal space. This reduction in inter-apodemal space ensures an unhindred move-

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ment of the apodeme through the basal rim of the parameral plate at the time of aedeagal protrusion.

Abductor of aedeagal apodeme (Fig. 9; No. 18). — The origin of the abductor muscle is lateral to that of the first retractor of aedeagus on the ventral wall of the parameral plate. Running in meso-posterior direction it crosses over the first retractor of aedeagus to end on the outer face of the aedeagal apodeme close to the ergot. Its action counteracts the effect of the adductor of aedeagal apodeme, and thereby, restores the apodeme back to its normal position. Furthermore, it is conceivable that during the course of action this muscle may work as "secondary retractor of the aedeagus" as well.

The Working of genitalia

The male brings the distal part of his abdomen, with its end turned in anterior direction, below the abdomen of the female. When the copulatory organ is about to enter the vestibulum the extrinsic protractor muscles of the basal ring become active with the result that it is produced out to its entire capacity. Simultaneously this is followed by contraction in the adductor muscles of the parameres which makes the distal region of the genitalia most tapering. Probably, at this stage the genitalia traverses the vestibulum unhindered to reach the female gonopore.

Now the adductor muscles of the parameres relax, and its abductor muscles undergo contraction. This brings an end to the unusual tapering condition of the distal portion of the genitalia and the parameres clasp the vestibular membrane.

Meanwhile the protractors of the volsellae and the extensors of the digitus become active with the result that the two digitus, with their free distal ends straightened, enter into the gonopore. Immediately after their entry the flexors of the digitus become active. These, being supported by the relaxation in the extensors of the digitus, bend the incisor surface of digitus which arrest by their conical projections the 2 rami of the first pair of valvulae.

When the male parasite has attained full hold on its partner the protractors of the aedeagus and the adductors of the aedeagal apodemes undergo simultaneous contraction. Their contraction push the aedeagus ahead of the remaining parts of the genitalia with the result that its distal apex with the phallotreme enters into the gonopore.

At the end of copulation the withdrawal of the male genitalia is effected in the following manner.

First of all the retractors of the aedeagus become active and withdraw the aedeagus with the help of relaxation shown by the protractors of the aedeagus. This is followed by relaxation in the flexors of the digitus and contraction in its extensors with the result that the digitus lose their grip, and the volsellae are taken out due to relaxation in the protractors of the

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volsellae. Now the adductors of the parameres and the retractors of the basal ring undergo simultaneous contraction and are assisted by relaxation in the abductors of the parameres and the protractors of the basal ring to withdraw the genitalia back to its normal position. Lastly, the abductors of the aedeagal apodemes which were so far unusually extended under the pressure of the adductors of the aedeagal apodemes contract back to their normal form, and consequently the normal condition is restored to the aedeagal apodemes.

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Aquatile Hemipteren und Coleopteren inmitten einer Großstadt

Von HERMANN DIETZE, Leipzig

Auf Leipzigs größtem Platze — früher „Augustusplatz“, jetzt „Karl-Marx-Platz“ genannt —, der inmitten der Stadt liegt, wurde im Jahre 1943 ein Löschwasserbecken angelegt. Herr PAUL WALZEL holte sich hier in den Jahren 1944 und 1945 Futter für seine Aquarienfische. Im Juli 1945 erzählte er mir, daß er bei dieser Gelegenheit zahlreiche verschiedenartige Wasserinsekten mit gefangen hätte. Ich bat ihn, diese in Zukunft nach Möglichkeit zu sammeln und mir zur Bearbeitung zu überlassen. Er widmete sich dieser Aufgabe mit großem Eifer und sammelte in der Zeit vom 24. 7. bis zum 1. 12. 1945 an 25 Tagen umfangreiches Material. Im Frühjahr 1946 hatte das Becken leider kein Wasser mehr. Die Bearbeitung der Tiere ergab 20 Hemipteren- und 24 Coleopterenarten. Von den Wanzen bestimmte mir Herr Dr. K. JORDAN, Bautzen, die *Micronecta meridionalis*, die 8 *Sigara*-Arten und einige Wanzenlarven. Bei der Bestimmung der Käfer half mir mein Freund EDGAR FICHTNER, Leipzig, und in allen Zweifelsfällen schickten wir das betreffende Material zur sicheren Determination an Herrn K. HOCH, Bonn. Allen Helfern sei für ihre Mühe herzlich gedankt!

Erstaunlich ist neben der großen Artenzahl auch die Häufigkeit mancher Arten, die es wahrscheinlich erscheinen läßt, daß es sich hier keineswegs nur um zugeflogene Exemplare handelt, sondern daß die Tiere in dem Becken — z. T. wenigstens — tatsächlich heimisch geworden waren. Für einige Hemipteren wurde die Richtigkeit dieser Annahme durch Funde von Larven, Nymphen und frisch entwickelten Imagines bewiesen.

Irgendwelche Vegetation war in dem Becken nicht zu sehen. Hieraus ist natürlich die Zusammensetzung der Fauna — z. B. zahlreiche Dytisciden, dagegen fast keine Hydrophiliden — zu erklären. Nach Diatomeen

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