**Bryconops (Creatochanes) inpai**, a new characoid fish from the Central Amazon Region, with a review of the genus *Bryconops*

by Hans-Armin Knöppel, Wolfgang Junk and Jacques Géry

While collecting around Manáus, one of us (J. G.)

working together with Dr. E.-J. Fittkau, found an interesting specimen of an unknown *Creatochanes*-like species in a small brook running through the "Reserva Ducke", the research area of the Instituto Nacional de Pesquisas da Amazônia near Manáus. Later on, Dr. Fittkau returned to the spot and was able to secure a number of additional specimens, together with ecological data, which enable us to present the following description:

*Bryconops* (Creatochanes) *inpai* sp. nov.*?* (fig. 1b)

Holotype (fig. 1b): ♂, 94.8 mm in standard length (115.0 mm total length); lower Rio Negro region, Igarapé Barro Branco, a brook in the "Reserva Ducke" (INPA) about 30 km from Manáus, collected by Dr. E.-J. Fittkau, November 1965 (poisoned with "Pronox").

Allotype: ♀, 93.7 mm in standard length (112.2 mm total length); same locality, collected with the holotype.

Paratypes: 1 ♂, 83.2 mm in standard length, same locality, collected by J. Géry and E.-J. Fittkau, 25.10.1965 (poisoned with "Pronox"); 3♂ (19 ♀ and 20 ♂), 63.7—97.8 mm in standard length, same locality, collected with the type.

The holotype has been deposited in the Instituto Nacional de Pesquisas da Amazônia, Manáus, Brazil. The allotype and part of the paratypes are in the collection of one of us (J. G.) under the number 0501. The other paratypes are in the Max-Planck-Institut für Limnologie, Plön, Germany.

Diagnosis: A generalized *Creatochanes* with faint humeral spots, caudal lobes not conspicuously marked. Depth 3.10—3.54, head 3.47—3.95 in the standard length; eye 2.94—2.97, interorbital 2.90—3.40, maxillary 2.29—2.65, and snout (oblique) 5.0—4.1 in the length of head.

Anal iii 22—25; scales 7—8/45—46/3.5—4 (44—45 scales with pores, and one or two on the caudal basis); external premaxillary teeth in a "weasy" line, maxillary teeth 1—3, dentary 5—6 + 5—8 smaller ones.

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1) During a research trip sponsored by the N.A.T.O. Foundation and the T.F.H. Fund.

2) For Instituto Nacional de Pesquisas da Amazônia (I.N.P.A.) which placed the material at our disposal.
Counts and proportions of the holotype (allotype between parenthesis): Depth 3.18 (3.14) and head 3.96 (3.94) in the standard length; snout-to-dorsal 1.11 (1.10); in dorsal-to-caudal; depth of peduncle 1.27 (1.26) in its length; eye 2.74 (2.72), interorbital 2.91 (2.90), maxillary (apparent length) 2.56 (2.59), and snout 3.23 (3.23) in the length of head. Dorsal 9 (9); anal 2 (3); scales 8/46/4 (7/46/3.5); 11 (10) in predorsal regular line, 18 (18) around peduncle; sexual hooks 20/6—14 (none).

Description and variability (see Table I for the principal proportions and counts of the 16 largest specimens): Body fusiform, relatively deep (concerning a Cretochanes), the greatest depth in front of the ventrals. Depth (in standard length) 3.08—3.60 (juv.), mean 3.27 ± 0.066 (N = 41, s = 0.42); there is a positive allometry (see later on). Peduncle longer than deep, its depth 1.27—1.66 in its length; dorsal fin in the middle, or slightly in advance of the middle of the body (snout-to-dorsal 1.04—1.26 in dorsal-to-caudal); pectorals not very short, their tips often reaching to ventrals or near to them, ventrals originating just in front of dorsal, reaching to first ray of anal; anal relatively short, beginning just after the level of the last dorsal ray and ending under
The counts of teeth was the same on both sides of dentary.

Table 1: Principal proportions and counts of 16 specimens of Bryconops (Crenatohanes) input sp. nov. (head without membrane, vertical diameter of eye, bony interorbital, teeth counted separately on the left and right side; number of anal rays with hooks, and number of hooks on each ray, presumably in males only).

<table>
<thead>
<tr>
<th>holotype</th>
<th>allotype</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sd. lgrh. (mm)</td>
<td>94.8</td>
</tr>
<tr>
<td>Sd. lgrh./depth</td>
<td>3.18</td>
</tr>
<tr>
<td>Sd. lgrh./head</td>
<td>3.79</td>
</tr>
<tr>
<td>Head/eye</td>
<td>2.73</td>
</tr>
<tr>
<td>Head/int.</td>
<td>2.31</td>
</tr>
<tr>
<td>Head/maxillary</td>
<td>2.36</td>
</tr>
<tr>
<td>Head/snout</td>
<td>3.23</td>
</tr>
<tr>
<td>D-C-S-D-T</td>
<td>ii</td>
</tr>
<tr>
<td>Anal.</td>
<td>iii</td>
</tr>
<tr>
<td>Ped. lgrh./depth</td>
<td>1.27</td>
</tr>
<tr>
<td>Scales lat.</td>
<td>46 (41)</td>
</tr>
<tr>
<td>Scales trans.</td>
<td>8/4</td>
</tr>
<tr>
<td>Scales predors.</td>
<td>11</td>
</tr>
<tr>
<td>Scales pedunc.</td>
<td>18</td>
</tr>
<tr>
<td>Ext. proc. teeth</td>
<td>0/5</td>
</tr>
<tr>
<td>Int. proc. teeth</td>
<td>4/5</td>
</tr>
<tr>
<td>Max. teeth</td>
<td>3/3</td>
</tr>
<tr>
<td>Dn. teeth</td>
<td>0/6 + 0/6</td>
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<tr>
<td>Hooks</td>
<td>210—14</td>
</tr>
<tr>
<td>Gill-rays</td>
<td>97—7</td>
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</table>

* The counts of teeth was the same on both sides of dentary.
Colour pattern rather unusual for a Creatochanes. In life, a bluish iridescence along the body, mostly along a 2–3 scales-wide longitudinal band spreading over the lower half of the peduncle; the fins are not brilliantly coloured, and the caudal shows no red, yellow or black spot or band. After preservation in formalin, a dark longitudinal band spreading over the lower half of the peduncle, running anteriorly to the level of dorsal; two dark humeral spots. The body is homogeneously brownish coloured above the longitudinal line. Both caudal lobes dark, the middle rays forming a rather dark band, not conspicuous as in most other Creatochanes-forms. Juvenile specimens (not designated as paratypes) have a rather different colour-pattern, mostly characterized by a dark line above anal-base, and a dark longitudinal band.

Biological and ecological data: The fishes were caught in the Igarapé Barro Branco, a 2–3 meters broad rain-forest stream, typical to the “terra firme” region of Central-Amazonia. The water is characterized by the low value of the pH, the poverty of electrolytes, and the more or less brownish coloration due to colloidal humus substances. (See FITKAE, 1964.)

Table II: Analysis of a rain-forest-stream in the Central-Amazon-Region (“Reserva Ducke” INPA, near Manaus)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>4.5</td>
</tr>
<tr>
<td>Hufa</td>
<td>30</td>
</tr>
<tr>
<td>O₂-saturation (%)</td>
<td>75%</td>
</tr>
<tr>
<td>free CO₂ (mg/l)</td>
<td>30.8</td>
</tr>
<tr>
<td>temp. water (°C ± 24.5)</td>
<td>24.5</td>
</tr>
</tbody>
</table>

Table 2: Analysis of a rain-forest-stream in the Central-Amazon-Region ("Reserva Ducke" INPA, near Manaus, near Manaus.)

A sample of water, taken by E.-J. Wittkau in 1961, was analysed by the M.-P.-I. (für Limnologe und, the data are recorded in Table II. As the water is extremely poor in soluble minerals, and the light scarce, plant-life is missing as well as most of the lower fauna which follows it in the nutrition-cycle. Thus the higher organisms living in the brook (mostly Decapods and Fishes), depend only on allochthonous material, dropped from the trees across the water or washed in by the rains.

The stomach of 15 dissected specimens of B. in pai contained approximately 70% of terrestrial insect remains: some Ephemeroptera and Termites and many Hymenoptera. The ants are preponderant; two species at least could be recognized, but not identified, viz a small, abundant form, which is brownish to yellow, and a larger one, much less abundant, which is brown to black. Trichoptera larvae seemed to be the only true aquatic food. In a few fishes, vegetal remains were rather abundant, composed mostly by some flowers and seeds.

B. in pai was associated with the following forms (recording only those forms taken with poison along 300 m or so):

Characoidi: 2 Hemigrammus spp., Pyrrhalta brevis, and Erythrinus erythrinus.
Gymnotoidei: Rhamphichthys sp. and Gymnotus carapo.
Siluriformes: Callichthys callichthys and Loricaris sp.
Cichlidae: Crenicichla sp. and Aequidens sp.

Fig. 2. Drawings of heads (profile, maxillary, and suture between 2nd and 3rd suborbital marked by heavy lines).
Fig. 3. Scales (taken from the left flank of the fish); the structure of the scale does not differ in *B. melanurus* and *B. affinis*.
Discussion and review of the genus

In spite of its colour-pattern, B. irai sp. nov. belongs to the genus Creatochanes sens. auct., according to the following characters: (1) elongate body-form; (2) relatively long maxillary forming, near its beginning, a strong curve, almost at a right angle; (3) transverse rows of scales, relatively to the depth of the body, numerous, lateral line running along the lower third of the body, lateral line complete; (4) two rows of multicuspid teeth on premaxillary, the inner row of no less than 5 teeth on each side, caudal lobes not scaled, adipose fin present etc.

In order to evaluate its morphological affinities, we compared it with a number of specimens of different forms as following (nomenclature after Eigenmann & Myers, 1929) (see Table III):

**Creatochanes melanos** (Bloch, 1795), type-species, 88 specimens from Upper Juruena, Rio Negro basin, Rio Peixê Boi (Pará), Lago Grande de Manacapuru, Rio Meta (Columbia), French Guiana, Surinam;

**Creatochanes affinis** Günther, 1864, 47 specimens from Upper Juruena, Rio Negro basin, French Guiana, British Guiana, Surinam;

**Creatochanes cundulatulus** Günther, 1864, 18 specimens from Rio Negro basin, French Guiana, Surinam;

We were able to study also a specimen of **Bryconops altiorhodius** Kner, 1859, collected by W. R. Allen, 1920, in the Upper Amazon.

Unfortunately, no specimens of the following species, apparently pertinent to the discussion, were available:

**Bryconops lucidus** Kner, 1859, Amazon basin;

**Creatochanes gracilis** Eigenmann, 1908, known from a single specimen from Rio Tapajós;

**Creatochanes cyrtogaster** Norman, 1926, apparently an endemic form from the Oiapok basin in French Guiana, of which Dr. F. P. H. Greenwood was kind enough to send us the photographs of the types. (fig. 1d)

**Bryconops durbinii** Eigenmann, 1908, only known from two small specimens from Rio Tapajós; 1)

**Antaichthys giaoopini** Fernández-Yepez, 1950, from Rio Autana in Venezuela2);

(1) **Creatochanes cundulatulus** (fig. 1a), in the sense of Eigenmann (1912) and Eigenmann & Myers (1929), the species is mostly caudal to identify: it has, almost always, 6 scales above lateral line (counting obliquely from under the first dorsal ray to the lateral line); in only one specimen (in 18 examined specimens), we have found 7 scales. The tip of the maxillary is never reaching the SO₂-SO₃ suture. Branched anal rays 28–30, never less. Although the scale (fig. 3f) is deeper than long, as in C. melanos and.

1) **Bryconops** is characterized by the incomplete lateral line, which runs only on three-quarter of the side, This may be a juvenile character: in 10 young specimens of **Creatochanes cundulatulus** (Rio Jutari, largest about 45 mm), the lateral line pores are to be seen only on the first scales (total 40–42). If not for the absence of the maxillary teeth, those specimens could be called **Bryconops durbinii**.

2) We do not believe that **Ramirichthys mouladi** Fernández-Yepez, 1949 (1 specimen from Edo. Guarico, Venezuela) belongs to the group.

3) The type from "South America" (Günther, 1884: 330) is said to have 36 rays (total): this raises serious doubt concerning Eigenmann's identification of the British Guiana material, which is said to have 28–31 anal rays. Our material is unquestionably *modified* of Eigenmann.

4) The figures in Cockerell (1914, plates 20 and 27), made from photographs, are difficult to interpret. We found useful to duplicate them with semi-schematic sketches.

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**Table III**

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Creative canthus</th>
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<th>Creative canthus</th>
<th>Creative canthus</th>
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<tr>
<td><strong>Rio</strong></td>
<td><strong>Melanos</strong></td>
<td><strong>Affinis</strong></td>
<td><strong>Cundulatulus</strong></td>
<td><strong>Durbinii</strong></td>
</tr>
<tr>
<td>1908</td>
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Notes on Table III:

1) Only known to us from literature.

2) The figures in Cockerell (1914, plates 20 and 27), made from photographs, are difficult to interpret. We found useful to duplicate them with semi-schematic sketches.
than reaching the black band on the upper border, which are evenly curved, without angles, as well as in the number of radii (though not as numerous as in B. alburnoides, fig. 3); the profile of the head (fig. 2) is somewhat intermediary between melanurus and affinis, whereas the maxillary length is definitively on the Bryconops "side"; another convergence with Bryconops is the almost constant absence of teeth on maxillary; in only two instances (in 18 examined specimens) there is one tooth on each side. The colour-pattern of the caudal is rather characteristic: the black band on the upper caudal lobe, surrounding the red spot (in vivo), is rarely reaching the tip of the lobe (fig. 5).

(2) The sympatric species Creatochaenus melanurus and C. affinis are extremely difficult to separate. We doubt if it would be possible to identify half-grown specimens (less than 60 mm) on morphological grounds. Both species have the same meristics, proportions, form of maxillary, scale structure, etc. The colour-pattern of the tail, at least in preserved specimens, is rarely of great use. Using our best preserved specimens in comparison with Eigenmann's (1912) plate 50, it was nevertheless possible to state what Eigenmann, who had seen and designed the type of melanurus, believed to be respectively melanurus and affinis (in spite of some discrepancies) in the key, published at the same time, as well as in Eigenmann & Myers, 1929). Working by degrees, we were finally able to find that the profiles of the head of mature specimens (fig. 2) are different: in C. melanurus the profile of the snout is almost straight, the premaxillary curve (which is typical of the "genera" Bryconops, Creatochaenus, etc.) is very accentuated at the front part of the bone (fig. 0), forming with the premaxillary an angle of 45° or less, this angle generally above an horizontal line through the pupil. In C. affinis (fig. 2 and 6) the profile of the snout is generally rounded, the premaxillary is high, without a "tip", the maxillary curve is forming an angle of more than 45° with the premaxillary, this angle being generally below the level of the middle of the pupil.

Although we were unable to quantify those differences, we have found that, generally, a perpendicular of a straight line, through nares and maxillary tip, enters the superior profile of the snout in C. melanurus, whereas this perpendicular is well above the superior profile of the snout in C. affinis.

These characters enable us to doubt the identification of the figure 5, plate 2 in Eigenmann (1917), a profile of the head labeled Creatochaenus affinis, which seems to be C. melanurus. We identify also as "true" melanurus a number of specimens from the Amazon basin (fig. 1), and we do not believe that melanurus is restricted to the Guianas as stated in Eigenmann & Myers (1929); accordingly, we do not question the record of C. melanurus from Obidos and Rio Tapajós, made by Steindachner (1873 and 1915, respectively plate 2 figs. 7 and plate 1 figs. 5-6), as did Eigenmann & Myers (1929: 457).

(3) Judging from the examination of a single specimen of Bryconops alburnoides Kner, 1839, type-species of the genus, the differential characters with the above discussed species are the following: head (fig. 2) more pointed, the snout apparently longer in profile, the maxillary (short and without teeth as in caudomaculatus) forming an angle almost as pronounced as in melanurus, and almost horizontal in direction; the outer premaxillary teeth very irregularly set: the two teeth which are displaced backwards, apparently coming from the outer row, may be well described as a middle row. The scales and anal rays are clearly more numerous; the structure of the scale (fig. 3) is rather near to that of caudomaculatus, but much more elongated (ratio length-to-depth about 1.1), with numerous radii. Judging from most used standards in Tetragonopterinae, those differences are scarcely of a generic nature; several overlappings of characters are involved: the snout is rather pointed in melanurus; the maxillary is often with teeth in at least two "Creatochaenus"-species, caudomaculatus and gracilis; in several small specimens of C. caudomaculatus from Rio Jufari (into Rio Negro), we found a disposition of the teeth which is near to that of Bryconops, with two teeth rather strongly displaced backwards and forming a rudimentary "middle series"; the scales in lateral line are more than 50 in "Creatochaenus" gracilis, the branched anal rays are more than 30 in, at least, C. gracilis, and perhaps in some C. caudomaculatus.

Two rather natural groups emerge from the preceding discussion. In the former one, we found species with relatively short, rarely toothed maxillary, and long anal fin (branched rays 28–35). These belong apparently to Bryconops nominal, and would comprise alburnoides, luwihis, gracilis, and caudomaculatus. The second group comprises
only the "sibling" species melanurus and affinis (fig. 1c-i-c')), which have a rather regular outer row of premaxillary teeth, a long, always toothed maxillary, and few branched anal rays (23–29). They belong to Creatochanes nominal which, we believe, cannot be accepted at a full generic level, but can be maintained, for convenience, as a subgenus of the older taxon Bryconops.

Another argument for the lumping of both genera is the discovery of the new form iupai which, in a sense, "bridges the gap" between Bryconops and Creatochanes: the length of the maxillary is intermediate between that of B. albimarginatus and that of B. melanurus; it is always toothed (1–5), but the external premaxillary row of teeth is always irregularly set, with one tooth (rarely two), strongly displaced backwards; the scales of lateral line and the branched anal rays are not numerous as in melanurus, but the transversal scales above lateral line are rather frequently (about 25%) as numerous as in Bryconops sens. str., viz 8, whereas in melanur- affinis it is very generally 7.

In the structure of the scale, the relative length of the head and the generalized colour-pattern, B. iupai is strongly different either from Bryconops sens. str. and from Creatochanes sens. str. We believe, nevertheless, that it is, in the whole, decidedly on the Creatochanes "side".

This can be summarized in the following speculative key:

a. Maxillary short, its tip not reaching to the suture between 2nd and 3rd suborbital (see also B. iupai sp. nov.); rarely toothed; branched anal rays 28–35 (Bryconops nominal)

b. Head rather pointed, the maxillary never toothed, almost horizontal; outer premaxillary teeth irregularly set, some teeth (generally 2) forming an incipient middle series; scales 8 (9) 55–62 / 3–4; branched anal rays: 30–36; scales quite elongate, with numerous radii

Bryconops (Bryconops) alburnoides and lucidas restricted to the Amazon basin?

bb. Head more rounded, the maxillary occasionally toothed; outer premaxillary teeth with occasionally one backwards displaced tooth.

c. Depth 4.5 in standard length; scales 8 / 547 / 3; branched anal rays probably 31; middle rays and distal part of upper caudal lobe dark

Bryconops (Bryconops) gracilis, Rio Tapajós

c. Depth less than 4.5 in standard length; scales 6 (very rarely 7) / 43–45 / 3–4; branched anal rays: 28–30; a red spot on the base of upper caudal lobe surrounded by a black one, the latter generally not reaching to the tip of the lobe:

Bryconops (Bryconops) cyanomaculatus Guianas and Amazon basin

(aa) Lateral line incomplete; maxillary teeth said to be numerous

Bryconops (Bryconochus) durius, Rio Tapajós

aa. Maxillary rather short, its tip not reaching to the suture between the 2nd and 3rd suborbital, but always toothed; branched anal rays 23–25; scales in adults without true radii, but with numerous, irregularly set grooves (fig. 3): head 3.4–

3.9 in standard length; two humeral spots (in formalin); no spot on upper caudal lobes, a band above anal and lower part of peduncle, ending in a black zone on the middle caudal rays, bluish in vivo; (scales 7–8 / 45–46 / 3.5–4; depth 3.1–3.54 in standard length, maxillary 2.29–2.65 in length of head, with 1–3 teeth)

Bryconops (Creatochanes) apiati sp. nov.

Rio Negro basin (Central Amazon Region)

aaa. Maxillary long, its tip reaching to the suture between the 2nd and 3rd suborbital, always toothed; branched anal rays 23–27 (29 in cyrtogaster), scales in adults generally with a few, very short radii, without irregularly set grooves; no true humeral spots; caudal lobes always marked; scales 7–8 / 43–46 / 4; depth 3.3–3.8 (3.0 in cyrtogaster), head 4.0–4.5 in standard length

d. Head rather pointed, with a long snout and a slender dentary, upper profile almost straight (fig. 2); colour-pattern of the upper caudal lobe as in cyanomaculatus, except that the black band generally extends up to the tip; lower caudal lobe always plain (fig. 5)

Bryconops (Creatochanes) melanurus

Guianas, Amazon, Rio Negro, Orinoco

(7 branched anal rays 28–29, depth 3.0 in standard length

B. (C.) melanurus cyrtogaster, Oyapok)

dd. Head obtuse, mouth short, dentary heavy, upper profile roundish; both caudal lobes dark, the upper one darker; the spot at the upper caudal base often yellow in vivo (more rarely red) (fig. 5)

Bryconops (Creatochanes) affinis

Guianas, Amazon and Rio Negro, Paraguay

**Resumo**

Descreve-se uma nova espécie de peixes Characidae, *Bryconops (Creatochanes) iupai*. Distingue-se a mesma das outras espécies, até agora conhecidas, daquele gênero pelos seguintes caraterísticas: comprimento menor do osso maxilar, estrutura das escamas sem raízes verdadeiras, duas manchas esparsas (em animais conservados em formalina).

Com uma série de características (comprimento dos maxilares, dentação dos maxilares; 1 dente da linha externa do premaxilar é sempre retroposto para dentro de uma "linha média"; rúmero e estrutura das escamas), B. iupai ocupa uma lugar intermediário entre as espécies dos dos gêneros Bryconops e Creatochanes.

Por isso, não se mantém mais a separação das espécies em dois gêneros, mas reumem-se ao mesmo dentro do gênero Bryconops (como a denominação mais antiga).

Uma comparação das espécies dos — até então — dois gêneros revela a existência de dois grupos com valores somente sub-genéricos. 1) Bryconops nominal (com maxilar relativamente curto e raras vezes denteado, com barbatana anal comprida); (B) lucidas, (C) gracilis, (C) cyanomaculatus. 2) Creatochanes nominal (com maxilar mais comprido, sempre denteado; linha externa dos dentes no pre-maxilar sem um dente retroposto; (C) melanurus, (C) affinis).

Os resultados da revisão são reunidos numa provisória chave de determinação.
Sôbre a BIologia de alguns Aracnideos na floresta tropical da Reserva Ducke (I.N.P.A., Manaus/Brasil) 1)

Von Ludwig Beck

Nos nossos conhecimentos sôbre a biologia de muitos artrópodes mostram ainda bastante lacunas. A razão disto é que este ramo animal só atinge sua enorme diversidade de formas nos trópicos, que eram dificilmente acessíveis durante longo tempo. No decorrer dos últimos 200 anos, os trópicos foram percorridos por muitos naturalistas até no mais distante rincão. Estas viagens trouxeram de fato grandes coleções com numerosas espécies novas, porém pesquisas sobre outras espécies animais sempre adiaram a indicação da localidade. Assim ocorre que o levantamento faunístico já está muitas vezes bem adiantado, enquanto pouco se sabe sobre a morfologia e a anatomia, menos ainda sobre o modo de vida, e nada sôbre a fisiologia de numerosas espécies animais, ou mesmo de ordens inteiras. Isto é especialmente válido para a Amazônia.

Somente com o estabelecimento de estações de pesquisas biológicas nas regiões tropicais pode o estudo do mundo animal das mesmas ultrapassar o nível puramente faunístico. Na Amazônia são sobretudo o Instituto Nacional de Pesquisas da Amazônia (I.N.P.A.), em Manaus, e em Belém, o Museu Goeldi e o Instituto de Pesquisas e Experimentação Agropecuárias do Norte (Ex-Instituto Agronômico do Norte), que possibiliram trabalhos em todos os campos da zoologia. Subvencionado pela Comunidade Alemã de Pesquisas e pelo Instituto Max Planck de Limnologia, em Plön/Alemanha, fui durante meio ano hospede do I.N.P.A. em Manaus, onde dediquei-me sobretudo a problemas da biologia do solo. Ao lado disso interessei-me pela história natural de diversos grupos de artrópodes, sôbre o que desejo dar a seguir uma vista geral. Desejo também expressar aqui a minha gratidão a todos os colaboradores do I.N.P.A., extremamente hospitalares e sempre prontos a ajudar, especialmente ao DD. Diretor, c.s.m. Sr. Dr. Djmal Batista, e aos auxiliares da Seção de Limnologia, Senhores Antônio dos Santos e Umberto dos Santos, cuja incansável agilidade veio tornar possível a realização do meu trabalho.

As melhores condições para o trabalho de campo são encontradas na Reserva Ducke, uma estação experimental de silvicultura do I.N.P.A., cerca de 30 km a nordeste de Manaus, cuja considerável área de 100 km² abrange, ao lado de superfícies manipuladas experimentalmente, uma ampla superfície de floresta primária que se pode percorrer por uma rede de pequenas picadas. Aqui o zoólogo encontra uma abundância de artrópodes que são, no máximo, conhecidos apenas pelo nome. Especialmente os aracnideos apresentam uma riqueza de formas quase única. Com exceção dos solífigos (Solilugae) que preferem biótopos mais sécos, vivem aqui representantes de tôdas as ordens e

1) Desejo manifestar meus cordiais agradecimentos ao Sr. H. Schuurse pela tradução do presente trabalho para o português.