Alvaro Wille Trejos

May 17, 1928-June 11, 2006

Alvaro Wille Trejos was born of Costa Rican mother, and father of German origin, on May 17, 1928. He spent his early years in a rural environment, surrounded by his family's coffee plantation and large patches of tropical forest. His family remembers that he was fascinated by small animals and began following them even before he could speak. As a child, he once suffered severe face and hand swelling after trying to produce home-made hot chili pepper paste.

In those days it was normal for young boys to learn the use of fire arms and hunting techniques. Soon he got fascinated by the extraordinary variety of tropical life around him, and spent much time observing insect behavior in the way of his much admired predecessor Jean Henry Fabre. In his own words "I observed in detail and photographed how horn structures are used by some male beetles during competition for females. I did not know, though, that the exact way these horns are used was considered a mystery at the time. Of course, I was only a lad and did not even think of publishing my observations".

One day an stuffed animal catched his eye and he was immediately interested. How could a dead animal be preserved and be made to look "life-like"?

His family was always supportive and soon he had someone teaching him the techniques. He remembered: "We followed an excellent learning method, but it required two specimens, so hunting for them was the hardest part because you had to be twice as lucky. The person teaching me would prepare one of the corpses and I would imitate him. I was particularly proud of a snake that I prepared through this 'learn by imitation' procedure".

Álvaro Wille Trejos

His relationship with the University of Kansas began when an expedition team from that institution arrived to the nearby port of Limón. They needed one guide to collect tropical rain forest specimens and somehow young Álvaro got that position. There he began a relationship with E. Raymond Hall, who saw the scientific potential of that brilliant boy. They kept corresponding and this led to an invitation to travel to Kansas and enroll in biology. In Álvaro's words: "Prof. Hall, a busy and famous

scientist, took time not only to read and answer all my letters, but also to mark up all the errors in my English. With every new letter from him, I also received my previous letter, edited, so that I could identify and correct my grammar mistakes!".

He excelled as a student in Kansas, where he was part of a team that worked for decades deciphering the evolution of insect sociality. The many gaps in the knowledge of social behavior in tropical species was a major obstacle for the project, and Álvaro's knowledge and work in Mesoamerica were basic to filling up those gaps.

Perhaps reflecting his old "stuffer" days, Álvaro enrolled in Kansas in a course about museum techniques and when he returned to Costa Rica, he established the Insect Museum, one of only six in the continent. Additionally to the scientific collections, the museum opened to the general public with evolutionary displays and ecological dioramas that were decades ahead of the meaningless accumulations of specimens that were frequent in museums at the time.

He spent his professional years at the University of Costa Rica's Agriculture Faculty where he was mentor to well known names in Costa Rican entomology, including William Ramírez, discoverer of the extraordinary active pollen transfer mechanism of fig wasps. Wille and Ramírez were among the few Latin American entomologists to reach what I call "text-book status" by being cited in American college entomology books.

When I was his student, he gave me a thick insect ecology volume and told me to read two chapters at a time and come every other week to his office so we could discuss what I had read. Every time I would arrive with my notes and an uncritical enthusiasm about the theoretical framework that the author presented for some biological phenomenon. He smiled in a fatherly way and proceeded to dissect the theory, show me the many holes that it had, and advise me to be skeptical and to look "farther ahead".

Many years later I began to fathom his wisdom and to realize the world-quality of his work. He published ethological observations and even some natural history of bees and beetles, but most of his work is composed of thorough studies that are still obligatory reading, for example his papers on the phylogeny of all insect orders (Wille 1960), evolution of the nerve cord in bees (Wille 1961), systematics of Mesoamerican *Trigona* (Wille 1965), morphology of feeding apparatus in bees (Wille 1970), fossil stingless bees (Wille 1977), phylogeny of the stingless bees of the world (Wille 1979) and biology of stingless bees (Wille 1983). The monumental work on the nest architecture of stingless bees that he coauthored with C.D. Michener (Wille and Michener 1973) is now a classical of the entomological literature.

When Mount Saint Helen erupted in 1980 and affected 200 000 km^2 of temperate ecosystems, the entomological studies (Pyle 1984) could add little to what he and G. Fuentes had reported in their paper on the effects of volcanic ash on insects (Wille and Fuentes 1975).

His university professor facet was balanced by a less known facet, Álvaro the adventurer. In search for fossilized bees he set an expedition to the Mexican jungle at a time when there were few roads and the struggle between settlers and indigenous inhabitants often lead to murder. He found himself surrounded by a machete-armed group who did not speak Spanish. "We did not look like settlers, so they sent for in interpreter and after listening to our explanations, they believed we were not dangerous because we were odd enough to be looking for insects trapped in sap, but…", he told me, and ended the phrase with a joke.

He also interned himself for prolonged periods in the isolated jungle of Corcovado in the south Pacific coast of Costa Rica, to study the ecology of a park that was endangered by illegal mining and urgently needed study and public attention. This almost cost him his life, but resulted in the extraordinary *Corcovado* (Wille 1987, 2001), a book that finely intertwines an evolutionary analysis of the park's ecology with philosophical considerations about the human condition and our place in the Universe. The book received the National Aquileo J. Echeverría Essay Award in 1983.

Rev. Biol. Trop. (Int. J. Trop. Biol. ISSN-0034-7744) Vol. 54 (4): XI-XV, December 2006

After one trip to the Andes, the cold weather affected him so much that he had to go to a hospital in Quito. He never really recovered, to the extent that during the production of the second edition of *Corcovado*, the University of Costa Rica Press sent a graphic editor to the hospital, where he reviewed page proofs in bed.

His final years were afflicted by bad health, but he frequently received proof of the love and admiration of those who knew him closely. At least three insect species were dedicated to him: Eulaema willei (Mouré 1963), Pseudomethoca willei (Mickel 1969) and *Gigantodax willei* (Vargas and Ramírez 1988); a special meeting of the Revista de Biología Tropical was made in his honor; The First Costa Rican Entomology Congress was dedicated to him; I. Gauld and P. Hanson dedicated their *Hymenoptera of Costa Rica* (Natural History Museum – London, 1996) to him, as I did with my *Ecología* (University of Costa Rica, 1995); and the Biodiversity Institute recognized his contribution to the knowledge and conservation of neotropical biodiversity.

Álvaro Wille Trejos passed away on June 11th, 2006.

ACKNOWLEDGMENTS

This account was possible because Álvaro Wille freely gave me information, advice and friendship for several decades. I am also thankful to his wife, anthropologist María Eugenia Bozzoli, for reviewing this manuscript and for permission to use this photograph from Álvaro's thick photographic album, and to Luko Hilje and Gilbert Fuentes, for suggestions to improve an earlier draft.

REFERENCES

Hanson, P. E. & I. D. Gauld (eds.). 1996. The Hymenoptera of Costa Rica. The Natural History Museum, London, England.

Mickel, C.E. 1969. *Pesudomethoca willei* n. sp., reared from cells of the bee *Lasioglossum (Dialictus) umbripenne* (Ellis (Hymenoptera: Mutillidae, Apoidea). *In* J. Kansas Entomol. Soc. 42: 524-526.

Mouré, J.S. 1963. Una nueva especie de *Eulaema* de Costa Rica (Hymenoptera, Apoidea). Rev. Biol. Trop. 11: 211-216.

Pyle, R. M. 1984. The impact of recent vulcanism on Lepidoptera, p. 323-326. *In* R.I. Vane-Wright & P.R. Ackery. The biology of butterflies. Academic, London, England.

Vargas, M. & J. Ramírez. 1988. *Gigantodax bierigi* & *G. willei* (Diptera: Simuliidae), two black fly species from Costa Rica. Rev. Biol. Trop. 36: 457-470.

Wille T., A. 1960. The phylogeny and relationships between the insect orders. Rev. Biol. Trop. 8: 93-122.

Wille T., A. 1961. Evolutionary trends in the ventral nerve cord of the stingless bees (Meliponini). Rev. Biol. Trop. 9: 117-130.

Wille T., A. 1965. Las abejas atarrá de la región mesoamericana del género y subgénero *Trigona* (Apidae-Meliponini). Rev. Biol. Trop. 13: 271-292.

Wille T., A. 1970. Notes on the morphology of the musculature of the salivary syringe and neck region of bees. Rev. Biol. Trop. 18: 33-52.

Wille T., A. 1977. A general review of the fossil stingless bees. Rev. Biol. Trop. 25: 43-46.

Wille T., A. 1979. Phylogeny and relatioships among the genera and subgenera of the stingless bees (Meniponinae) of the world. Rev. Biol. Trop. 27: 241-278.

Wille, A. 1983. Biology of stingless bees. Ann. Rev. Entomol. 28: 41-64.

Wille, A. 1987. Corcovado: meditaciones de un biólogo. Un estudio ecológico. Universidad Estatal a Distancia, San José, Costa Rica. 403 p.

Wille, A. 2001. Reflexiones y estudios de un biólogo en las selvas de Corcovado. Universidad de Costa Rica, San José, Costa Rica.

Wille, A. & C.D. Michener. 1973. The nest architecture of stingless bees with special reference to those of Costa Rica (Hymenoptera, Apidae). Rev. Biol. Trop. 21 (Suppl. 1): 1-278.

Wille, A. & G. Fuentes. 1975. Efecto de la ceniza del Volcán Irazú (Costa Rica) en algunos insectos. Rev. Biol. Trop. 23: 165-176.

Julián Monge-Nájera
Biología Tropical, Universidad de Costa Rica, 2060 San José, San José, Costa Rica; rbt@ucr.ac.cr

PUBLICATIONS BY ÁLVARO WILLE TREJOS

Checklist by Gilbert Fuentes,
Organization for Tropical Studies;
gilbert@ots.ac.cr

Wille, A. 1954. Muscular adaptations of the nectar-eating bats (Subfamily Glossophaginae). Transactions of the Kansas Academy of Science 57: 315-325.

Wille, A. 1955. Comparative studies of the thoracic musculature of bees. Thesis M.A. Lawrence, The University of Kansas, Kansas, USA.

Michener, C.D., E.A. Cross, H.V. Daly, C.W. Rettenmeyer & A. Wille. 1955. Additional techniques for studying the behavior of wild bees. Insect. Soci. 9: 237-246.

Wille, A. 1956. Comparative studies of the thoracic musculature of bees. Univ. Kansas Sci. B. 38: 439-49.

Wille, A. 1958. A comparative study of the dorsal vessels of bees. Ann. Entomol. Soc. Am. 51: 538-546.

Wille, A. 1959. A new fossil stingless bee (Meliponini) from the amber of Chiapas, Mexico. J. Paleontology 33: 849-852.

Wille, A. 1960. The phylogeny and relationships between the insect orders. Rev. Biol. Trop. 8: 93-123.

Wille, A. 1960. A new species of stingless bee (Meliponini) from Bolivia. Rev. Biol. Trop. 8: 219-223.

Wille, A. 1961. Evolutionary trends in the ventral nerve cord of the stingless bees (Meliponini) Rev. Biol. Trop. 9: 117-129.

Wille, A. 1961. Las abejas jicotes de Costa Rica. Rev. la Universidad de Costa Rica 22: 1-30.

Wille, A. 1961. The bionomics of a primitive social bee, *Lasioglossum inconspicum*. The University of Kansas Science Bulletin 42: 1123-1202.

Wille, A. 1962. A new species of stingless bee (Meliponini) from Costa Rica. Rev. Biol. Trop. 10: 177-181.

Wille, A. 1962. A revision of the subgenus *Nogueirapis*; an archaic group of stingless bees (Hymenoptera: Apidae). J. New York Entomol. S. 70: 218-234.

Wille, A. 1962. A technique for collecting stingless bees under jungle conditions. Insectes Sociaux 9(3): 291-293.

Wille, A. & C.D. Michener. 1962. Inactividad estacional de *Megacephala sobrina* Dejean (Coleoptera Cicindelidae). Rev. Biol. Trop. 10(2): 161-165.

Wille, A. 1963. Phylogenetic significance of an unusual African stingless bee, *Meliponula bocandei* (Spinola). Rev. Biol. Trop. 11(1): 25-45.

Wille, A. 1963. Behavioral adaptations of bees for pollen collecting from *Cassia* flowers. Rev. Biol. Trop. 11(2): 205-210.

Wille, A. 1964. Notes on a primitive stingless bee, *Trigona (Nogueirapis) mirandula.* Rev. Biol. Trop. 12: 117-151.

Wille, A. 1965. A new species of stingless bee (Meliponini) from Costa Rica. Rev. Biol. Trop. 13: 139-141.

Wille, A. 1965. Las abejas atarrá de la región mesoamericana del género y subgénero *Trigona* (Apidae-Meliponini). Rev. Biol. Trop. 13: 271-291.

Wille, A. 1966. Notes on two species of ground nesting stingless bees (*Trigona mirandula* and *T. buchwaldi*) from the Pacific rain forest of Costa Rica. Rev. Biol. Trop. 14: 251-277.

Wille, A. 1966. Clasificación del Orden Lepidoptera. Universidad de Costa Rica, San José, Costa Rica.

Wille, A. 1968. Clasificación del Orden Hymenoptera. Universidad de Costa Rica, San José, Costa Rica.

Wille, A. 1969. A new species of stingless bee *Trigona (Plebeia)* from Costa Rica, with descriptions of its general behaviour and cluster-type nest. Rev. Biol. Trop. 15: 299-313.

Wille, A. & G. Fuentes. 1969. Apuntes sobre la taxonomía de los insectos (excepto Entopterygota y Superorden Hemipteroidea). Universidad de Costa Rica, Serie Agronomía no. 11, Sann José, Costa Rica.

Wille, A. & E. Orozco. 1970. The life cycle and behavior of the social bee *Lasioglossum (Dialictus) umbripenne* (Hymenoptera: Halictidae) Rev. Biol. Trop. 17: 199-245.

Fuentes, G., P.L. Kazán & A. Wille. 1970. Introducción al estudio del Orden Coleoptera. Universidad de Costa Rica, Serie Agronomía, San José, Costa Rica.

Wille, A. 1970. Estudio del Superorden Hemipteroidea. Universidad de Costa Rica, Serie Agronomía no. 13, San José, Costa Rica.

Wille, A. & G. Fuentes. 1970. Introducción al estudio de la taxonomía de los insectos (excepto Endopterygota). Universidad de Costa Rica, Serie Agronomía no. 15, San José, Costa Rica.

Wille, A. & C.D. Michener. 1971. Observations on the nests of Costa Rican *Halictus* with taxonomic notes

on neotropical species (Hymenoptera: Halictidae). Rev. Biol. Trop. 18: 17-31.

Wille, A. 1971. Notes on the morphology of the musculature of the salivary syringe and neck region of bees. Rev. Biol. Trop. 18: 33-51.

Wille, A. & G. Fuentes. 1972. Introducción al estudio de la taxonomía de los Ordenes Lepidoptera e Hymenoptera. Universidad de Costa Rica. Serie Agronomía no. 15, San José, Costa Rica.

Wille, A. 1973. Observations on the behavior of a tropical rain forest dung beetle, *Megathoposoma candezei* (Harold), Coleoptera: Scarabaeidae. Rev. Biol. Trop. 21: 41-57.

Wille, A. & C.D. Michener. 1973. The nest architecture of stingless bees with special reference to those of Costa Rica (Hymenoptera: Apidae). Rev. Biol. Trop. 21(Suppl. 1): 1-279.

Wille, A., E. Orozco, G. Fuentes, E.M. Solís. 1974. Additional observations on the behavior of a tropical forest dung beetle, *Megathoposoma candezei* (Coleoptera: Scarabaeidae) Rev. Biol. Trop. 22: 129-133.

Wille, A. & E. Orozco. 1975. Observations on the founding of a new colony by *Trigona cupira* (Hymenoptera: Apidae) in Costa Rica. Rev. Biol. Trop. 22: 253-287.

Wille, A. & G. Fuentes. 1975. Efecto de la ceniza del Volcán Irazú (Costa Rica) en algunos insectos. Rev. Biol. Trop. 23: 165-175.

Wille, A. 1976. Las abejas jicotes del género *Melipona* (Apidae: Meliponini) de Costa Rica. Rev. Biol. Trop. 24: 123-147.

Wille, A. 1977. A general review of the fossil stingless bees. Rev. Biol. Trop. 25: 43-46.

Wille, A. 1978. Apuntes sobre la morfología interna de los insectos. Universidad de Costa Rica, Museo de Insectos, San José, Costa Rica. 25 p.

Wille, A. 1979. A comparative study of the pollen press and nearby structures in the bees of the family Apidae. Rev. Biol. Trop. 27: 217-221.

Wille, A. 1979. Phylogeny and relationships among the genera and subgenera of the stingless bees (Meliponinae) of the World Rev. Biol. Trop. 27: 241-277.

Wille, A. 1983. Biology of the stingless bees. Ann. Rev. Entomol. 28: 41-64.

Wille, A. 1983. Corcovado: Meditaciones de un biólogo. EUNED, San José, Costa Rica. 227 p.

Wille, A., E. Orozco & C. Raabe. 1983. Polinización del chayote *Sechium edule* (Jacq.) Swartz en Costa Rica. Rev. Biol. Trop. 31: 145-154.

Wille, A. 1985. Las abejas *Peponapis* y *Xenoglossa* en Costa Rica y su importancia en la polinización de las *Cucurbita* domésticas. Rev. Biol. Trop. 33: 17-24.

Wcislo, W.T., A. Wille & E. Orozco. 1993. Nesting biology of tropical solitary and social sweat bees, *Lasioglossum (Dialictus) figueresi* Wcislo and *L. (D.) aeneiventre* (Friese) (Hymenoptera: Halictidae). Insect. Soc. 40: 21-40.

Wille, A. 2001 Reflexiones y estudios de un biólogo en las selvas de Corcovado. Universidad de Costa Rica, San José, Costa Rica. 503 p.