**Online Supplement 3: A Selection of Proto-Mayan and Early Mayan Lexical Items**

(compiled by Christophe Helmke, based—with amendments—on Kaufman with Justeson 2003 and Kaufman 2017:78–102).

Note: **PM:** Proto-Mayan, **SM:** Southern Mayan, **CM:** Central Mayan, **EM:** Eastern Mayan, and **WM:** Western Mayan

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|  | **Branch** | **Lexeme (monomorph.)** | **gloss** | **Branch** | **Lexeme (polymorph.)** | **gloss** |
| **Animals** | PMSMSMEMSMPMCMPMPMSMPMSMPMPMSMSMPMSMPMPMSMPMSMCMCMEMSMEMPMCMPMPMSMSMSMCMCMPMPMPMSMPMCMSMPMSMSMSMCM | *nooq’**baɁtz’**maax**k’ooy**tixl**kehj**tz’iɁ**oɁq**koj**kuɁk**baɁh**ch’oɁh**huhty**sootz’**tzooɁ**tuɁx**t’iiw ~ t’ihw**k’uty**jooj**ty’oK**q’aɁaw**xooch’**mooɁ**q’uɁq’**xeew**ak’**ib**imul**peetz ~ peety**kok**kaan**soɁty**wooɁ**kar**t’oot’**puur**poty**siip**am* *uk’**us**kaq’**jut**kaab**haɁh**xeɁn**chiil**sahk’**lool* | ‘animal’‘howley monkey’‘spider monkey’‘long-tailed monkey’ (CH: capuchin?)‘tapir’‘white-tailed deer’‘(domesticated) dog’‘feral dog, coyote’ < pMS \**uku* ‘dog’‘cougar, mountain lion’‘squirrel’‘gopher’‘mouse’‘possum’ (tlacuache)‘bat’‘male bird’‘female bird’‘hawk’‘buzzard, vulture’‘raven’‘boat-tailed grackle’ (zanate)‘boat-tailed grackle’‘screech owl’‘macaw’‘quetzal’‘bluebird’‘turkey’ (guajolote) < ‘large bird’‘nine-banded armadillo’‘rabbit’‘turtle’‘turtle’‘snake’‘rattlesnake’‘toad’‘fish’‘snail’ (jute, caracol)‘snail’ (caracol)‘bedbug’‘tick’‘spider’ ‘head louse’‘gnat’‘flea’ (pulga)‘grub’‘honey(-bee)’‘green fly’‘mosquito’‘cricket, grashopper’ (grillo, saltamontes)‘cicada’‘cricket’ | SMPMSMPMPMPMSMSMSMCMCMCMPMCMCMPMSMPMPMCMPMCMCMCMPMPMSMCMSMPMSMSM | *aalaq’**saq-biin**pahar**bahlam**hahlaaw**tz’ikiin**ty’eel**ty’eje*C*tz’uunuɁn**tuhkul**muukuur**pumuuy**kuyu*C*kaqix**ak’aach**palach**ikiin**ohko*C*ahiin**oohan**amooch**mutz’utz’**utzaaɁ uk’**saq uk’**ook-*VC *k’aq**siinaɁŋ**hoonon**ahqaaŋ**kuhkaɁy**sanik**pehpen**luqum* | ‘domestic animal’‘weasel’‘skunk’‘juguar’ [hider]‘agouti’‘bird’ (raptorial bird)‘parrot, parakeet’‘woodpecker’‘hummingbird’‘horned owl’‘dove’‘wild dove’‘parrot’ (perico)‘macaw’‘wild turkey’ (pavo de monte)‘tom turkey’ (guajolote)‘(barn) owl’‘lizard’‘caiman’‘iguana’‘frog’‘little fish’‘nit’ [‘its-shit-of-louse’]‘body louse’‘chigger’ (nigua) [‘enter-ing flea’]‘scorpion’‘wasp’‘wasp’s nest’‘firefly’‘ant’‘butterfly’‘earth-worm’ |
| **Plants** | PMPMPMPMPMSMCMCMCMCMSMSMPMSMPMSMCMCMPMCMCMCMPMPMCMCMPMCMSMWMCMCMWMCMCM | *tyeeɁ**baty**baq’**haɁas**huɁŋ**jih**muuy**nahq’**piit**tzitz**peeq**tz’iin**tyaj**lah**xaɁŋ**map**k’iib**hoɁox**quul**k’uhm ~ k’uum**q’ohq’**pixp**tz’uɁl**tees ~ tzees**mahy ~ maɁy**siik’**tzihb**kiih**tuhs**suɁn**muuh**k’im**puuj**pajk**tzitz* | ‘tree’‘cork tree’ (*Helopcarpus appendiculatus*)‘seed, pip, pit’‘marmelade fruit’ (zapote mamey)‘ficus’ (> ‘paper’)‘oak’ (Quercus spp.)‘sapodilla’ (*Manilkara zapota*)‘pit, kernel’‘elephant ear’ (*Enterolobium* sp.)‘aguacatillo’ (*Nectandra* sp.)‘wild cacao’‘sweet cassava’‘pine’‘nettle’‘palm’‘cohune palm’ (*Orbignya cohune*)‘parlor palm’ (pacaya, *Chamaedorea* sp.)‘annatto’ (achiote, *Bixa orellana*)‘vine, creeper’ ‘pumpkin’ (ayote, *Cucurbita pepo pepo*)‘winter squash’‘tomato’‘herb’‘pigweed’ (bledo, *Amaranthus* sp.)‘tobacco’ (*Nicotiana tabacum*)‘cigar’ (puro)‘fern’ (Pteridium)‘century plant’ (Agave)‘marigold’ (flor de muerto, *Tagetes* sp.)‘sunflower’ (*Tithonia rotundifolia*)‘American black nightshade’ (*Solanum*)‘straw’‘cattail reed’ (tule, *Typha*)‘pineapple’ (*Ananas comosus*)‘aguacatillo’ (Nectandra) | SMSMSMCMPMCMPMPMCMCMPMPMCMPMPMPMPMCMSMCMPMPMEMPMSMCMPMSMPMSMSMCMSMCMPMPMPM | *aajaaw tyeeɁ**ixiɁm tyeeɁ**k’uh tyeeɁ**sanik tyeeɁ**tz’iin tyeeɁ**q’an tzuhh**ikaq’**kenaq’**pehtaq(’)**ty’upaq**inuup**kaqaaj**iityaaj**abal**q’iinom**apak’**aqit**k’isiis**k’uxub* *k’iwex**tz’usub**kaŋib ~ chaŋib**tuɁlul**toq’oor**sakiil**muukun**ch’imaah**ch’abiɁn**kakaw**aaq**aɁq’**aaj**iik’**eek’**ooŋ**ajx ~ ojx**iis* | ‘white sapote’ (*Casimiroa edulis*) [‘lord tree’]‘breadnut’ (*Brosimum alicastrum*) [‘maize tree’]‘tropical cedar’ (*Cedrela odorata*) [‘god tree’]‘Spanish elm’ (*Cordia alliodora*) [‘ant tree’]‘yucca’ (*Manihot esculenta*) [‘cassava tree’]type of mushroom [‘yellow-bottlegourd’]‘guava’ (guayaba, *Psidium* sp.)‘beans’‘prickly pear’ (nopal, tuna, *Opuntia*)‘soapberry’ (*Sapinus saponaria*)‘silk-cotton tree’ (ceiba, *Ceiba pentandra*)‘gumbolimbo’ (*Bursera* spp.)‘pot-herbs, greens’‘hogplum’ (jocote, *Spondias* spp.)‘hogplum’ (jocote, *Spondias* spp.)‘palm (tree)’‘pricklenut’ (*Guazuma ulmifolia*)‘cypress’ (*Cupressus* spp.)‘annatto’ (achiote, *Bixa orellana*) ‘soursop’ (anona, *Annona muricata*)‘grape?’ (*Vitis* sp.)‘bamboo’ (Bambusa, Arundinaria)‘marmelade fruit’ (zapote mamey)‘willow’‘pumpkin seed’‘summer squash’‘chayote’ (*Sechium edule*)‘rattlepod’ (chipilín)loan from pMS‘grass’‘vine’‘reed’ (carrizo)‘chile’‘bromelia’ (tecolumate, *Bromelia*)‘avocado’‘breadnut’ (ramón, *Brosimum* sp.)‘sweet potato’ (*Ipomoea batatas*) |
| **Maize** | PMPMCMPMPMCMPMSMSM | *ajn**ŋal**hiɁh**ix**q’oor**buuch**k’aj**maatz’* *uul* | ‘roasting ear’ (elote)‘maize ear’ (mazorca)‘young maize ear’ (jilote)‘to shell (maize cob)’‘maize dough’ ‘leached maize, hominy’ (nixtamal)‘pinole’‘maize gruel’ (atole)‘maize gruel’ (atole) < Sokean pSo \**unu* | PMPMSMCMPMSM | *baqal**tz’utuj**ix-iɁm**ix-iɁm-a**tyaɁŋ**sak-haɁ* | ‘maize cob’ (olote) < *baq* ‘bone’?‘maize tassel’ < cf. pSokean \**tzutuɁ*‘maize kernels from the cob’‘to shell (dry) maize’s‘ash(es)’ = ‘lime’ (for slacking maize)‘maize gruel’ |
| **Food + agriculture** | PMSMCMSMSMPMPMSMPM | *aw**k’il**bol**q’ut**puty**q’al**kaaɁ**huɁx**keeɁ* | ‘to plant/sow’‘to toast, roast’‘to broil’‘to mash (chili, tomato)’‘to crush, squash (chili, tomato)’‘maize field’ (milpa)‘metate, quern’‘whetstone’‘to grind’ | CMCMPMPMPMSMCMCMCM | *awbal**awal**iiyaaŋ**keeɁe**aɁtz’aam**uq’ab kaaɁ**aq’iin**aq’een**ikaj* | ‘planting-stick’ (*coa*)‘planting’‘seed’ (for planting)‘to grind’‘salt’‘mano, muller’‘weeding corn’‘wooden platform for metate’‘axe’ |
| **Material culture** | SMSMSMSMSMPMSMPMCMSMSMPMSMSMPMPMCMPMPMSMCMPMSM | *tyiiŋ**tuhx**nooq’**buhq**tz’is**kem**bon**weex**peeq**tz’ihb**ŋaah**beeh**pohp**teem**ch’aaq**mul**q’ihb**laaq**tzuhh**k’ooj**lem**tyaah**tyooq’* | ‘cotton’‘cottonseed’‘cotton (thread), clothing’‘clothing’‘to sew’‘to weave’‘to dye, colour’‘trousers, pants’‘length of cloth’ ~ ‘blouse (huipil), skirt’‘to paint / write’‘house, dwelling’‘road’‘mat’ (petate)‘seat, bench’ (asiento, banco)‘bed’‘water jug’ (cántaro)‘water jar’ (tinaja)‘plate, dish’‘water gourd’ (tecomate)‘mask’‘mirror’‘obsidian’‘chert’ | SMCMCMPMCMCMPMPMCM | *peteht**xihab**aalaɁs**waj*V*b**ty’uɁuy**ihqatz**atyooty ~ atyuuty**tzimah**jukuub* | ‘spindle whorl’‘comb’‘toy’ (juguete)‘musical instrument’‘bag’‘load, carga’‘home, house’‘gourd dipper’ < pMS \**tzimaɁ*‘dugout, canoe, through’ (canoa, batea, comedero) |
| **Society + world** | PMPMPMSMPMSMPMPMSMPMEMPMPMCMSMPMSM | *kab**kaɁŋ**q’iiŋ**witz**iik’**eeq’**iɁq’**ŋab**baty**q’ahq’**sib**siiɁ**bix**bity**poom**laab**wahr* | ‘earth’‘sky’‘sun, day’‘mountain’‘moon’‘star’‘wind’‘rain’‘hail’‘fire’‘smoke’‘firewood’‘dancing’‘to sing’‘copal, incense’ < pMS \**poom~~u~~*‘enchantement, bewitching’‘animal spirit, companion, counterpart’ | CMPMSMCMPMSMCMCMSMCMCM | *aamaaq**aajaaw**ajq’iiŋ**pataan**abaaht**haɁab**malaaj**tahiiw**taq’aaŋ**eewiir**ooŋeer* | ‘town, pueblo’‘lord’‘day-keeper’ (ritual specialist)s‘tribute’‘servant’‘year’ < ‘water-time’ (rainy season)‘coast’ (Pacific)‘frost’‘field, plain’‘yesterday’‘before, a long time ago’ |

Glancing at the lexicon of Proto-Mayan (above) gives us a better idea of the inherent features of this culture and how these contrast with those of the pre-ceramic peoples of the lowlands. Regarding plant and animal life, we can see the Proto-Mayan speakers had an intimate knowledge of highland species, especially of the colder more temperate climates (e.g. \**tyaj* ‘pine’, \**jih* ‘oak’, \**tzihb* ‘fern’ and \**lah* ‘nettle). Despite this familiarity with the highlands, Proto-Mayan speaker evidently also had knowledge of lowland plants as well, although interestingly many of these lexical items are descriptive (e.g. \**k’uh tyeeɁ* ‘cedar’, \**aajaaw tyeeɁ*, ‘white sapote’, \**sanik tyeeɁ* ‘Spanish elm’, \**tz’iin tyeeɁ* ‘yucca’, or *ixiɁm tyeeɁ* ‘breadnut’), polymorphemic (\**ikaq’* ‘guava’, \**pehtaq(’)* ‘prickly pear’, \**ty’upaq* ‘soapberry), or derived forms (\**kaqaaj* ‘gumbolimbo’, \**q’iinom* ‘hogplum’, \**ch’imaah* ‘chayote’, \**k’uxub* ‘annatto’, or \**kaŋib* ‘bamboo’), suggesting that these were less well known and added to the lexicon at a later date. The same type of dichotomy is evident in animal life, with the names of highland animals typically adhering to a more monomorphemic form (e.g. \**kuɁk* ‘squirrel’, \**baɁh* ‘gopher’, \**ch’oɁh* ‘mouse’, \**kaab* ‘bee’, \**haɁh* ‘fly’, \**jooj* ‘raven’, \**xeew* ‘bluebird’ and \**q’uɁq’* ‘quetzal’), whereas animals of the lowlands are again more descriptive (e.g. \**hahlaaw* ‘agouti’, \**kuhkaɁy* ‘firefly’, \**siinaɁnh* ‘scorpion’, \**ty’eje*C ‘woodpecker’, \**tz’uunuɁn* ‘hummingbird’, and \**muukuur* ‘dove’). Interestingly, Proto-Mayan had a surprisingly underdeveloped repertoire concerning fish and aquatic resources, as only \**kar* ‘fish’ is securely reconstructed—even though the existence of \**mutz’utz’* ‘little fish’ has also been proposed. The sea and coastal areas were evidently much beyond the linguistic heartland, but the Pacific Coast was known as \**malaaj* (Kaufman 2017:95) and an early compound \**q’aɁq’-najb* can be reconstructed for ‘sea’, built upon ‘(freshwater) pool, pond’, and modified by ‘fire’, here possibly serving as an augmentative, or descriptor (see Kettunen and Helmke 2013:18-20).

In particular, we can establish semantic pairings, and doublets such as *ajx* vs. \**ixiɁm tyeeɁ* both for ‘breadnut’, \**hoɁox* vs. \**k’uxub*, both for ‘annatto’, \**koj* ‘cougar, mountain lion’ vs. \**bahlam* ‘jaguar’, \**nooq’* ‘animal’ vs. \**aalaq’* ‘domestic animal’, \**tz’iɁ* ‘(domestic) dog’ vs. \**oɁq* ‘feral dog, coyote’, and \**kames* ‘centipede’ vs. \**chapaaht* ‘centipede’. These telling pairings reveal that knowledge of certain plants may have been introduced on two separate occasions, resulting in lexical doublets. Likewise, we can see that the great feline of the lowlands, the jaguar, was named descriptively as a *bahlam*, which etymologically means ‘the one who hides’ ~ ‘hider’ (Fox 1978:163), in much the same way as the larger tropical centipedes encountered in the lowlands were described as *chapaaht*, ‘coiler’ (Lacadena and Wichmann 2004:141). Possibly related to this same phenomenon are items such as *bojb ~ bojbi*, which is glossed as ‘coyote’ in Ch’orti’ (Hull 2016:74) also known from Yukatek where it is named *bobil* and *boboch*, although there it is thought of as a monstrous quadruped (Barrera Vásquez 1980:58). We surmise that these terms entered into lowland languages during the Preclassic, prior to the advent of agriculture and the dispersal of coyotes from the tropical lowlands (see Hody and Kays 2018). The etymon \**oɁq* is of also interest as it does not conform to the canonical closed-syllable roots (i.e. CVC or CVxC [where x = h, Ɂ, j, s, x]) of Proto-Mayan and Mayan languages generally. Such non-canonical forms, analyzed by some as vowel-initial and by others as glottal-initial, constitute a narrower and special class of terms in Mayan languages and although no substantive efforts have been made to explain these (but see Kaufman 2015), it can be remarked that these constitute a sub-set of the lexicon that behaves rather differently from most other terms. In this regard, in addition to ‘coyote’ we can point out the lexical items *ak’(aach)* ‘(wild) turkey’, *ib(aach)* ‘armadillo’, *ikiin* ‘owl’, *imul* ‘rabbit’, *ahiin* ‘caiman’, *oohan* ‘iguana’, and *ohko*C ‘lizard’. Concerning plants we have an equally interesting set, including \**aaq* ‘grass’, \**aɁq’* ‘vine’, \**oonh* ‘avocado’, \**ajx* ~ \**ojx* ‘breadnut’ and \**iis* ‘sweet potato’. Without wanting to suggest that these may be some of the lexical items of the so-called substratum languages that were introduced into early Mayan languages through contact with lowland peoples, these terms differ phonologically and the semantics conceivably belong to the lowland sphere.

 These types of distinctions in the lexical domain are also evident when it comes to terms pertaining to agriculture, domesticates and associated items of material culture. Thus we see a wide range of terms pertaining to maize and the preparation of maize, but we also see that many of the domesticates have terms that are morphemically more complex or derived than those of plants found in their wild state, in orchards or horticultural situations (Cagnato, this special section; Prufer et al., this special section). The following items can be reconstructed for Proto-Mayan indicating an intimate knowledge of this primary domesticate, including \**ŋal* ‘maize ear (mazorca), \**hiɁh* ‘young maize ear (jilote), \**ajn* ‘roasting ear (elote)’, \**buuch* ‘leached maize, hominy (nixtamal)’, \**q’oor* ‘maize dough’, \**k’aj* ‘pinole’, and \**maatz’* ‘maize gruel (atole)’. Terms specifically related to agriculture include \**aw* ‘to plant, sow’, \**aw-al* ‘planting’, \**aw-bal* ‘planting-stick (coa)’, \**q’al* ‘maize field (milpa)’ and \**aq’iin* ‘to weed a maize plot’. The processing of maize, and the elaboration of both flour and dough was achieved through grinding on a \**kaaɁ* ‘quern (metate)’ with an \**uq’ab kaaɁ* ‘muller (mano)’, both usually set on a small wooden platform known as an \**aq’een*. Fascinatingly, \**ixiɁm* the origin of the word for ‘maize’ in most all Mayan languages, originally meant ‘maize kernels from the cobs’ and is a polymorphemic construction, derived from the verbal root *ix*- ‘to shell (maize)’, with derived forms such as *ix-iɁm-a* ‘to shell (dry) maize’. In the preparation of maize, the word for the pulverized lime used in the nixtamalization process, can be reconstructed as \**tyaɁnh*, with the literal meaning of ‘ash(es)’, indicating either a partial semantic displacement or rather that the alkaline solution of maize was originally based on ashes (Campbell 1979:958; Kaufman 2017:98; see also Smith-Stark 1994:34-36). Aside from maize a range of other domesticated plants can also be reconstructed, among these \**k’uhm* ‘squash’, \**iik* ‘chiles’ and \**kenaq’* ‘beans’, wherein the Proto-Mayan etymon, at present, predates archaeologically attested specimens (Brown 2006; Law 2013:145).

 Concerning other items of Proto-Mayan culture we can see that they knew of \**tyiinh* ‘cotton’, \**nooq’* ‘cotton (thread)’, spun with a \**peteht* ‘spindle whorl’, to \**tz’is* ‘sew’ and \**kem* ‘weave’, \**buhq* ‘clothing’, \**peeq* ‘length of woven cloth’ and by extension ‘blouse (huipil), skirt’, as well as \**weex* ‘trousers’. The ceramic industry was well known, given terms such as \**mul* ‘water jug (cántaro)’, \**q’ihb* ‘water jar (tinaja)’, and \**laaq* ‘plate, dish’, used in combination with \**tzuhh* ‘bowl (tecomate)’, the latter made from gourds, or skeuomorphically of clay. Other items of the ‘house’ \**ŋaah* and ‘home’ \**atyooty*, included \**teem* ‘seat, bench’, \**pohp* ‘woven mat (petate)’, \**chaaq’* ‘bed’, \**xihab* ‘comb’, \**aalaɁs* ‘toy (juguete)’, *waj*V*b* ‘musical instrument’, \**k’ooj* ‘mask’, and \**lem* ‘mirror’, all attesting to the sedentary life of agriculturalists. Terms such as \**beeh* ‘road’ and \**jukuub* ‘dugout, canoe’ reveal the means and modes of transport. With regards to the lithic industry, we the raw materials \**tyooq’* ‘chert’ and *tyaaj* ‘obsidian’ are reconstructed on equal footing, as well as formal tools such \**ikaj* ‘axe’ used for clearing forests and \**huɁx* ‘whetstone’ to polish the ground stone axes. Unfortunately, lexical items for other formal tools and their manufacture are absent, and it is unclear whether this reflects a reality of Proto-Maya language and culture, or whether this is a product of the dictionary entries available for modern and colonial Mayan languages, reflecting diminished use of stone tools following the Spanish conquest, or lack of elicitation during the elaboration of these dictionaries. As to hunting implements, the ‘blowgun’ cannot be reconstructed for Proto-Mayan (Kaufman with Justeson 2003:927-928), but ‘spears’ were \**ch’aab*, with some semantic displacement for ‘arrow’ during the Postclassic (Kaufman with Justeson 2003:940).

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