



Plant barcoding: Historical perspective

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Can we barcoding plants with COI?



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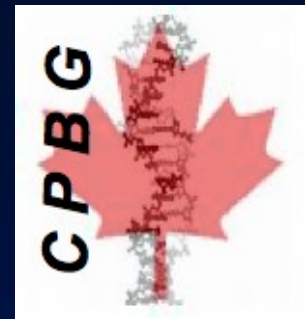
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The Literature 2005

- **Chase *et al.*** (Phil. Trans. R. Soc. B 360, 1889–1895)
 - ✓ Multi-locus barcode (MBC)
 - ✓ Nuclear barcode
 - ✓ High Quality MBC Bank
 - ✓ Use of existing samples from Herbaria, Museums, Botanical Gardens

- **Kress *et al.*** (PNAS vol. 102, no. 23, 8369–8374)
 - ✓ Non-coding barcoding region, *trnH-psbA*
 - ✓ Multigene approach
 - ✓ Tool for forensic investigations



The Literature 2006



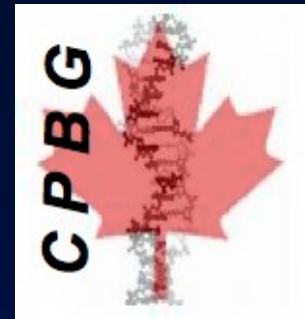
- **Newmaster *et al.*** (C. J. Bot. 84: 335-341)
 - ✓ Multigene tiered approach (coding/non-coding)
 - ✓ Evaluated 10,000 *rbcL* sequences (GenBank); discriminate 85% species in congeneric pair-wise comparisons
 - ✓ Routine identification tool & ecological applications

- **Cowan, Chase, Kress & Savolainen** (Taxon 55 (3) 611–616)
 - ✓ Consortium for the barcode of life (CBOL)
 - ✓ The ideal plant barcode 1) relatively short in length (~700bp), 2) more variable between than within species, and 3) easily amplifiable with universal primers
 - ✓ Taxonomically complex groups (TCG; e.g., introgression, apomixis...)
 - ✓ Tool for biodiversity inventories & conservation assessments

The Literature 2006

- **Presting** (Can. J. Bot. 84: 1434–1443)
 - ✓ Identification of conserved regions in the plastid genome: implications for DNA barcoding
 - ✓ Universal Plastid Amplicon (UPA)
- **Schneider & Schuettpelz** (Molecular Ecology Notes 6: 989–991)
 - ✓ DNA-based identification using *rbcL* fern gametophytes
 - ✓ Application of a tool for studying fern gametophyte ecology
- **Taberlet *et al.*** (*Nucleic Acid. Res.* 35: e14)
 - ✓ plastid intron *trnL* for plant DNA barcoding
 - ✓ Application of a tool in food industry and diet analyses based on feces

The Literature 2007



- **Little & Stevenson** (Cladistics 23, 1-21)
 - ✓ Comparison of algorithms for identification of specimens using DNA barcodes: examples from gymnosperms

- **Newmaster *et al.*** (Molecular Ecology Notes - in review)
 - ✓ Demonstrated the utility of 6 coding (Universal Plastid Amplicon – UPA, *rpoB*, *rpoC1*, *accD*, *rbcL*, *matK*) and 1 non-coding (*trnH-psbA*) chloroplast loci for barcoding in the neotropical genus *Compsoeura* (nutmeg family)
 - ✓ Used **TaxonDNA** (Meier *et al.*, 2006, 2007 in press)
 - 1) **66% correctly identified (*trnH-psbA*)**
 - 2) **95% correctly identified (*matK* & *trnH-psbA*)**

Announcements 2007:

CBOL (<http://www.rbgekew.org.uk/barcoding/update.html>)

- ✓ Present two options for standardising on a plant DNA barcoding protocol (protocols and primers on web site above):
 - 1) Three plastid genes, *rpoC1*, *rpoB* and *matK*
 - 2) Two plastid genes, *rpoC1* and *matK*, and a plastid intergenic spacer, *psbA-trnH*



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