Appendice électronique 1

Modification de la fonction Specpool du package Vegan (Oksanen et al. 2011) pour les gros jeux de données où il n'est pas possible de faire un tableau croisé au démarrage

```
new_specpool <- function (x, pool)
{
    x <- as.matrix(x)
    if (missing(pool))
        pool <- rep("All", nrow(x))
    if (length(pool) != NROW(x))
        stop("length of 'pool' and number rows in 'x' do not match")
    if (any(nas <- is.na(pool))) {
        pool <- pool[!nas]
        x <- x[!nas, , drop = FALSE]
    }
    out <- seq(1:nrow(x))
    groups <- table(pool)
    inds <- names(groups)
    S <- var.chao <- chao <- var.jack1 <- jack.1 <- jack.2 <- var.boot <- bootS <- rep(NA,
        length(inds))
    names(S) <- names(var.chao) <- names(chao) <- names(var.jack1) <- names(jack.1) <-
names(jack.2) <- names(var.boot) <- names(bootS) <- inds
    for (is in inds) {
        a1 <- a2 <- NA
        gr <- out[pool == is]
        n <- length(gr)
        if (n <= 0)
            next
        X <- table(as.factor(as.vector(x[gr,1])),as.factor(x[gr,2]))
        freq <- colSums(X > 0)
        p <- freq[freq > 0]/n
        S[is] <- sum(freq > 0)
        if (S[is] == 0)
            next
        if (n >= 1)
            a1 <- sum(freq == 1)
        if (n >= 2)
            a2 <- sum(freq == 2)
        else 0
        chao[is] <- S[is] + if (!is.na(a2) && a2 > 0)
            a1 * a1/2/a2
        else 0
        jack.1[is] <- S[is] + a1 * (n - 1)/n
        jack.2[is] <- S[is] + a1 * (2 * n - 3)/n - a2 * (n -
            2)^2/n/(n - 1)
        bootS[is] <- S[is] + sum((1 - p)^n)
        aa <- if (!is.na(a2) && a2 > 0)
            a1/a2
        else 0
```

```
      var.chao[is] <- a2 * (0.5 + (1 + aa/4) * aa) * aa * aa
      if (!is.na(a1) && a1 > 0) {
        jf <- table(rowSums(X[, freq == 1, drop = FALSE] >
          0))
        var.jack1[is] <- (sum(as.numeric(names(jf))^2 * jf) -
          a1/n) * (n - 1)/n
      }
      pn <- (1 - p)^n
      X <- X[, freq > 0, drop = FALSE]
      Zp <- (crossprod(X == 0)/n)^n - outer(pn, pn, "*")
      var.boot[is] <- sum(pn * (1 - pn)) + 2 * sum(Zp[lower.tri(Zp)])
    }
  out <- list(Species = S, chao = chao, chao.se = sqrt(var.chao),
    jack1 = jack.1, jack1.se = sqrt(var.jack1), jack2 = jack.2,
    boot = bootS, boot.se = sqrt(var.boot), n = as.vector(groups))
  out <- as.data.frame(out)
  attr(out, "pool") <- pool
  out
}
```